

THE IRON AGE

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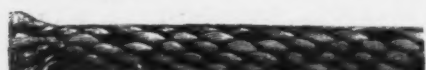
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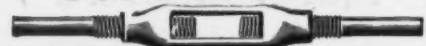
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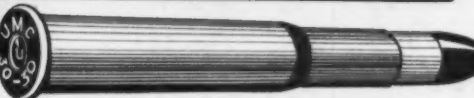
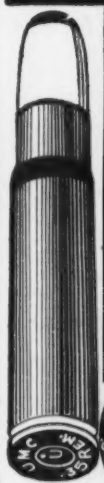
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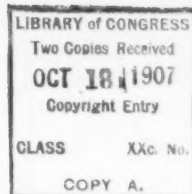
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THE IRON AGE

New York, Thursday, October 17, 1907.



A Historic Iron Works.

The Tredegar Company's Plant, Richmond, Va.

BY THEO. D. MORGAN.

The Tredegar Iron Works in Richmond, Va., is probably the most interesting historically in the country. It was established in 1836, and to the importation of puddlers from Tredegar, England, it owes its name. The present plant is modern in every respect and now covers an area of 23 acres. Except for the forge hammers, the

jectiles. During our Civil War, the works was used as an arsenal by the Confederate Government and was the chief source of supply for guns and projectiles. Here was rolled the iron that covered the far famed Confederate iron clad, the Merrimac. During the Spanish-American War, large quantities of cast iron projectiles were furnished the Government and at this time contracts are being filled for these, to be used in practice shooting.

Aside from its industrial importance during the Civil War, the Tredegar Company was officially well represented; Major Archer, an officer of the company, was also an officer in the Confederate army, and Gen. Joseph

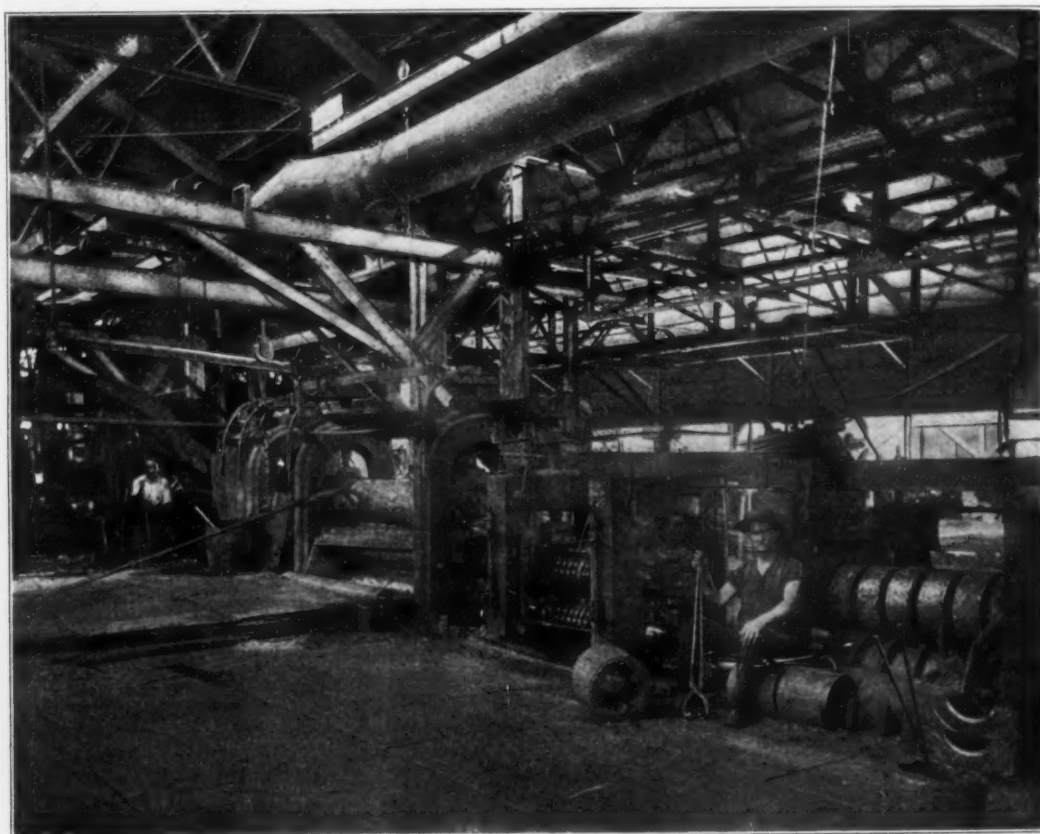


Fig. 1.—The Bar Mill at the Tredegar Iron Works, Showing the Old Two-High Mill Which Rolled the Iron for the Merrimac.

entire plant is driven by water power, derived from the old Kanawa & Ohio Canal. This canal is said to have been planned by George Washington, and was intended to connect the Atlantic Ocean with the Ohio River. It was never completed further west than Buchanan, Va., as it was found impossible to secure a steady supply of water beyond this point. This canal, however, proved a boon to Richmond, as it has been the means of drawing a great many industries to that city.

At present the working force is between 1200 to 1500 and the product comprises bar iron and steel of all kinds, including forgings, car axles, horse shoes, railroad and boat spikes, car wheels, general castings and machinery. Four years after its establishment the works passed into the hands of General Joseph R. Anderson, who continued at the head until his death in 1892. The third generation of this family is now represented in the management by Archer Anderson, Jr.

In the early days of the United States navy the plant was extensively employed on government work. The company built and equipped the wooden frigates Roanoke and Colorado and the United States revenue cutter James K. Polk and also made large quantities of guns and pro-

R. Anderson was in active service. At the battle of Seven Pines the latter was wounded, and was then retired, to become again the active head of the Tredegar Works. Captain Edward Archer, who was and still is engineer of the works, was sent to England to supervise the erection of warships then building in English shipyards, for the Confederate service. Under his supervision the noted cruiser Alabama was built. Coming back to the United States in the Hawk, a privateer, he was blockaded in a Bermuda port and compelled to remain there till the end of the war.

Captain Archer was in the United States navy before the outbreak of the Civil War and became a captain in the Confederate navy. Under the direction of Captain Brooks, who designed the Merrimac, Captain Archer prepared the iron that covered the noted vessel. This iron was in plates 8 in. wide and 2 in. thick and was rolled from old iron rails, muck bar and scrap, or "anything we could get," as the Captain explained. Continuing, he said: "The only old rails we had were those taken from the tracks by the Northern soldiers. They were heated, then bent and twisted about trees so we could not again use them. All the straight rails had to be saved to

repair tracks. Scrap was scarce, too, in those times, and we were compelled to gather up everything we could find, in order to get the iron made. The 8 x 2 in. plate was rolled from rail piles and fagots on our regular

Merrimac, as a very able man, saying that he was the real secretary of the Confederate navy.

It is a mooted question as to which was really the first iron clad warship, Captain Ericsson's Monitor, or

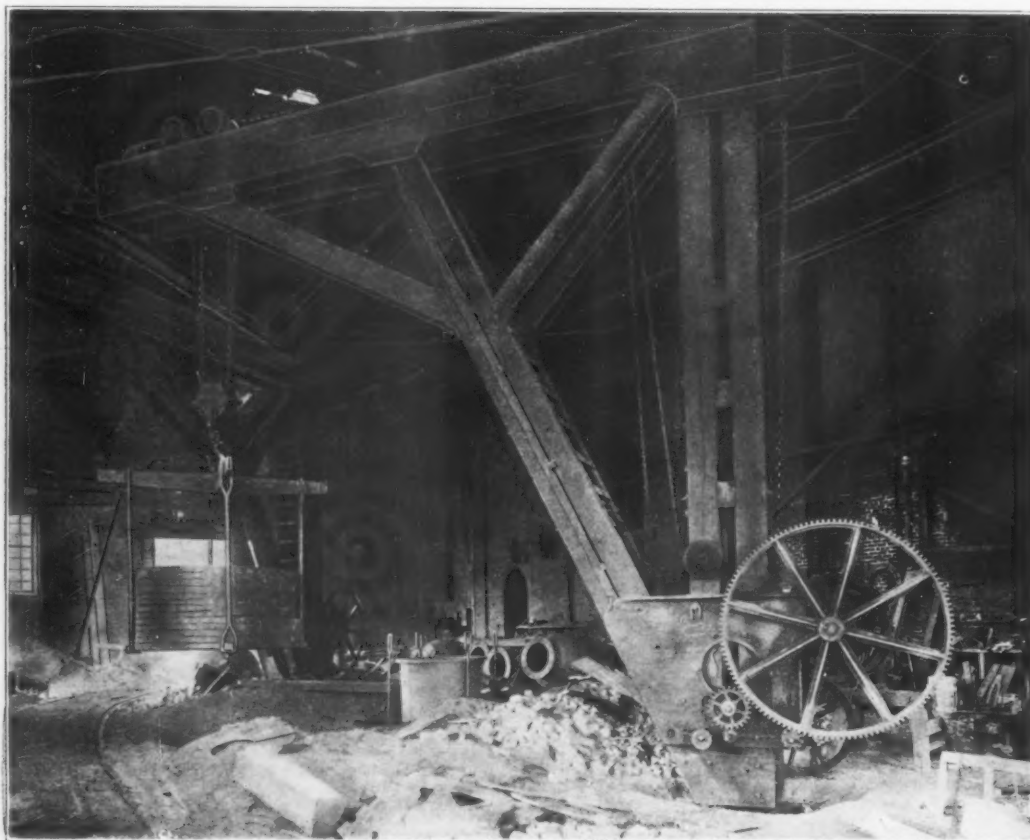


Fig. 2.—Interior of the Gun Foundry, Where Most of the Confederate Guns Were Cast During the Civil War.



Fig. 3.—The Old Gun Lathes in the Tredegar Iron Works, Now Used for Turning Rolls.

18-in. bar mill. One layer of these plates was placed on the sloping sides of the Merrimac and bolted to 30 in. of teak backing. Around the gun ports the plates were doubled, making a thickness of 4 in. there." Captain Archer spoke feelingly of Captain Brooks, designer of the

the Confederate Virginia, built out of the hull of the frigate Merrimac. The Merrimac was known in the South as the Virginia. The frigate Merrimac was originally built by Merrick & Sons in Philadelphia, Pa. She fell into the hands of the Confederates, was cut down

almost to the water's edge, rebuilt with sloping sides, and covered with iron made by the Tredegar Company, and was rechristened the Virginia. Her career was short but eventful. On her trial trip, March 8, 1862, accompanied by two small gunboats, she rammed and sunk the U. S. Frigate Cumberland, off Newport News, Va., destroyed the U. S. Frigate Congress, blew up a transport steamer, sunk one schooner and captured another. On the next day, in Hampton Roads, she engaged the United States iron clad Monitor. This fight between the Merrimac and the Monitor is famous as the first battle between iron clads. The Merrimac was afterward burned by the Confederates, on May 10, 1862, on their evacuation of Norfolk.

Fig. 1 shows the bar mill on which the iron for the Merrimac was rolled. It is an ordinary 18-in. mill. The old fashioned two-high housings shown are those in which the iron was rolled. The three-high roughing sets are later additions. The present roller, James H. Wade, is seen sitting in front of the mill. He is a son of Edward Wade, who rolled the iron for the Merrimac. Mr. Wade has been in the employ of the Tredegar Company since his boyhood. The mill is in excellent condition and in steady operation, turning out splice bars and merchant bars of all kinds.

Fig. 2 is an interior view of the gun foundry, as it is now and as it was during the war, when making guns and projectiles for the Confederate Government. The two cranes shown are each of 30-tons capacity, commanding the three gun pits between them; only one of these pits is shown, the others being no longer in use. Back of the wall are two air furnaces. In the casting of large guns both of these furnaces were used, the melted metal being run into a reservoir on the floor, and thence into the mold in the pit. The foundry is now producing general castings.

No. 3 shows the gun lathes. They are now used as roll lathes for dressing the mill roll. On these practically all of the guns for the Confederate army and navy were turned and bored. They were run night and day and Sunday, without a moment's stop, except for repairs, during the years of the Civil War. Guns were made of all sizes, from field pieces up to 7-in. guns, and as all were bored from the solid, as well as turned, each required an immense amount of work. The output numbered thousands, with hundreds of tons of shot and shell. Two great Rodman guns, 11 or 12 in. bore, were also made, but after completion they were found too heavy for transportation, and were never used. They were subsequently broken up and used for scrap.

The man standing at one of the lathes is G. P. Perrini, who has been continuously employed at these works for 55 years. Under his direction all the gun finishing was done—boring, turning and rifling. According to his statement, he perfected a method of rifling guns which was superior to any in use at that time, and this method was adopted by the Federal Government on capturing some Confederate guns. Proof of this was found in the rifling of Federal guns afterward captured by the Confederates.

An interesting fact told by Mr. Perrini, which is probably little known, is that the Confederates used a number of wooden guns. They were mortars for throwing shells, and more than 150 were turned out at the Tredegar plant. They were made from gun wood, turned and banded heavily with iron bands shrunk on. As Mr. Perrini explained: "It was either use wood or nothing, for we had no more iron." It is doubtful if many are aware that such primitive weapons were used as late as our Civil War.

The Lorain Casting Company.—The Lorain Casting Company has completed the erection of a new foundry at Lorain, Ohio, and commenced casting operations last week. The foundry building is 110 ft. in width and 130 ft. in length, with a center bay 50 ft. in width, and served with a 30-ton electric travelling crane. The cupola and core oven capacity is suitable for the production of large castings up to the capacity of the crane. The equipment of the foundry throughout is strictly modern

and should place the company in condition to manufacture castings economically and serve the needs of its clients. Contracts have been secured from a number of local buyers of castings which insure the company a fair amount of business, but considerable margin is left for general commercial requirements. The officers of the new concern are: E. M. Pierce, president and treasurer; R. Thew, vice-president, and F. A. Smythe, secretary. H. B. Davison, formerly superintendent of the Lorain Foundry Company and later with the National Tube Company, is in charge of all foundry operations.

The Landis Corrugated Grinding Wheel.

Concerning the form of a new corrugated corundum wheel lately invented by Ezra F. Landis, La Salle, N. Y., the accompanying illustration is self-explanatory. On account of the corrugations in the sides of the wheel, the cutting surface follows a wavy course producing an oscillating contact with the work and hence a shearing cut. The effect is much the same in principle as that of a milling cutter made with helical instead of axial teeth. It is



The Landis Corrugated Corundum Wheel Made by the American Emery Wheel Works, Providence, R. I.

reported by the inventor that in a comparative test of two 8-in. wheels, one plain and the other corrugated, the latter did four times as much work in a given time as the former, and with only 25 per cent. increased wear.

A number of these wheels have been made by the American Emery Wheel Works, Providence, R. I., and some are now in use by one of the leading builders of grinding machinery. The manufacturer of the wheels is prepared to make them of any diameter up to 24 in. and any thickness required. The thickness through the cutting surface is one-half the over-all thickness of the wheel; in other words, the concavities, alternately cut into the opposite sides of the wheel, extend half way through it. The wheels are made of either emery or corundum, and by either the vitrified or silicate process. A corrugated wheel, it is claimed, will give a finish equally as fine as that produced by a plain wheel of the same material.

Buffalo's Sheet Steel Plant.—The first sheet of steel to be manufactured by the Seneca Iron & Steel Company, Buffalo, N. Y., was turned out October 5, and it proved a good one. The company now has three of its mills at work, and the other mills will be started as soon as the building and equipping of them are finished. When it is running full force it will have nine mills going, five hot mills, one roughing mill and three cold mills. This is the first sheet mill in New York State and the first in the country to use electricity for power.

It is reported that the Bethlehem Steel Corporation, which has been gradually dismantling its shipbuilding plant at San Francisco, Cal., known as the Union Iron Works, has decided to reopen the plant and put it in shape so that it will be in condition to make repairs to battleships when the fleet reaches the Pacific Coast.

The Austrian Iron Industry.*

A Review of Its Progress in the Past Twenty-Five Years.

BY WILHELM KESTRANEK.†

At the meeting of the Iron and Steel Institute held in Vienna 25 years ago, the celebrated Prof. Peter von Tunner described the iron industry of Styria and of Carinthia as representing the iron industry of the whole of Austria. He warned the members present at the meeting who were prepared, as you are now, to visit the centers of production of the Austrian iron industry, that they might be disappointed in their expectations, and his statements principally dealt with the reasons why the Austrian iron industry generally, and that of Styria and of Carinthia especially, had remained stationary, and had been surpassed by that of England, of Germany, and even of France and Belgium.

He referred to the proud past of the ancient Alpine iron industry, and made due mention of the legend that the nails with which Christ was crucified were made of Noric iron obtained by the Romans from the Alpine districts. From the description of Peter von Tunner, the Austrian iron industry appeared to play the rôle of an impoverished nobleman, who, while regarding the future with apprehension, recalls the past with pride. The iron industry of the monarchy has, however, not resigned itself to this rôle. Indeed, it has spared no endeavor to maintain its position; and I believe that in view of the development of the home iron industry during the last 25 years, I am in a position to state that these endeavors have been successful, even if the industry, for reasons which will be considered later, has not reached that degree of development which the leading iron and steel-producing countries have reached during this period.

A Twenty-Five Year Comparison of Output.

In order to ascertain what progress has been made it will be necessary to compare the present production of pig iron with that of 25 years ago. In the year 1882 the world's production of pig iron, which in the year 1807 had been 760,000 metric tons, had reached about 21,000,000 metric tons. To this total the most important producing countries contributed the following proportions:

	Metric tons.
Great Britain.....	about 8,600,000
United States.....	about 4,600,000
Germany, including Luxemburg.....	about 3,400,000
France	about 2,000,000
Belgium	about 700,000
Austria-Hungary	about 600,000
Russia	about 400,000
Sweden	about 400,000
Spain	about 100,000

The world's annual production of pig iron is at the present time about 61,500,000 metric tons; and the various iron-making countries now stand in the following order:

	Metric tons.
United States.....	about 27,000,000
Germany, including Luxemburg.....	about 12,800,000
Great Britain.....	about 10,100,000
France	about 3,400,000
Russia	about 2,800,000
Austria-Hungary	about 1,900,000
Belgium	about 1,500,000
Sweden	about 600,000
Spain	about 400,000

From the above it will be seen that the iron industry of the monarchy, which 25 years ago held the sixth place among iron producing countries, still occupies the same position, while in the meantime other countries have undergone many changes. For instance, Great Britain has had to cede the leading position to the United States, and during the last few years has also been surpassed by Germany. France, where the conditions of the iron industry resemble in many respects those of this country, has been able to maintain its place in the fourth position. The fifth place, which is now occupied by Russia, was

wrested from Belgium, whose production of iron formerly exceeded that of Austria-Hungary.

The Austrian iron industry contributes the principal share to this increase in the production of pig iron in Austria-Hungary, and the increase approaches to that of Great Britain during the same period. Of the 612,000 metric tons of pig iron produced in 1882 in Austria-Hungary, 436,000 tons were produced in Austria and 176,000 tons in Hungary. To the present total production of 1,910,000 metric tons, Austria contributes 1,434,000 metric tons, Hungary 450,000 tons, and Bosnia 46,000 tons.

It is interesting to note that during the last 25 years the world's production of pig iron increased in value from about 1,700,000,000 Austrian crowns to about 4,800,000,000 crowns, while the value of the production of gold rose from 510,000,000 crowns to 1,950,000,000 crowns. The value of the pig iron produced represents at the present time about two and a half times the value of the output of gold.

A Scarcity of Coke.

If Peter von Tunner, 25 years ago, rightly ascribed the advantages of the leading countries in the European iron industry as due to their abundance of mineral fuel, it may still be said that the progress of the Austrian iron industry would have been far greater if coke had been available in greater quantities.

The country, however, suffers from a scarcity of coking coal, and for this reason it has had to import coke from foreign countries, especially from Germany. In 1906 the production of coke in Austria was 1,700,000 metric tons, which for other countries the following returns are available:

	Metric tons.
France (1906).....	1,700,000
Russia (1906).....	2,000,000
Belgium (1905).....	2,200,000
Great Britain (1905).....	18,300,000
Germany (1906).....	20,300,000
United States (1905).....	29,200,000

Austria-Hungary exports yearly about 300,000 metric tons and imports about 600,000 metric tons, so that the difference of 300,000 tons has to be obtained from abroad.

Austria-Hungary possesses several very rich deposits of iron ore, such, for instance, as the celebrated Styrian Ore Mountain. A more extensive smelting of the Austro-Hungarian ores is hindered by the want of fuel, and for this reason Austria-Hungary at the present time is one of those countries which export iron ore.

The imports of iron ores amount yearly to 246,000 metric tons, and the quantity exported, to which Hungary contributes the largest share, amounts to 324,000 tons.

Production Gauged by Fuel.

It can be taken as an axiom that development of the iron industry of a country, in relation to the consumption, depends more on the richness of its fuel resources than on an abundance of iron ore. Thus it is seen that countries such as Sweden and Spain, which are rich in ore and poor in fuel, export the greater part of their output of ores to countries rich in fuel, and are, in proportion to their wealth in ore, only small producers of pig iron. Other countries, on the other hand, such as Great Britain, which depends to a large measure on the importation of iron ores, and Germany—which also has to import considerable quantities of ore—occupy a leading position. It is unnecessary to mention the happy position of the United States, a country which rejoices in the possession of an abundance of ore and of coking coal, and for this reason naturally occupies the leading position.

The quantity and quality of the iron ores are as important a factor in commercial competition in the iron industry of a country as are the number and condition of the soldiers of an army; while the fuel resources are for the iron industry what the generalship and armament are for such an army. Under otherwise equal conditions the superiority in training and equipment of an army are more efficacious at the present time than mere weight of numbers. It, therefore, appears to me that the quality and quantity of fuel available are more decisive factors in the industrial development of the iron trade of a country than wealth of ores.

* A paper read before the Iron and Steel Institute at Vienna, September, 1907.

† General manager of the Prager Eisen-Industrie-Gesellschaft and of the Böhmische-Montan-Gesellschaft.

If I may further develop this comparison, it may be mentioned that the conditions of two combatants are also naturally influenced by other important circumstances, such as the existence of ramparts, or, in other words, protective duties; further, by the natural resources and financial wealth of the two competitors, which in the case under consideration is the demand of the home market. Finally, the fortune of war depends on whether the forces are kept free from disease. Such diseases, mostly of a contagious character, are strikes, and the efforts of organizations to hinder production.

As an example, I believe that the development of the British iron trade would have been far more successful if the introduction of technical improvements had not been hindered by the action of trade organizations.

It must be especially remarked, with reference to the demand of the Austrian market, that there is a great need of development, because large tracts of territory—not only in the mountainous Alpine districts, but also in the east of the empire—are capable of a more intense productive activity.

It must be here mentioned that the yearly output in Austria of merchant iron is not more than 350,000 metric tons—150,000 tons of girders, 70,000 tons of rails, and 65,000 tons of sheets.

Per Capita Consumption of Iron.

The consumption of iron in any country obviously depends, to a considerable extent, on the population; and for this reason, in order to judge the figures given and particularly the amount of the production of pig iron of the several iron producing countries, their populations are compared for the years 1882 and 1906:

Population of Chief Iron Producing Countries.

	1882.	1906.
United States.....	49,000,000	90,700,000
Germany.....	45,500,000	61,500,000
Great Britain.....	31,400,000	44,200,000
France.....	36,000,000	39,300,000
Russia.....	77,000,000	120,000,000
Austria-Hungary.....	42,700,000	49,100,000
Of this fell to—		
Austria.....		27,300,000
Hungary.....		20,000,000
The occupied provinces.....		1,800,000
Belgium.....	5,900,000	7,300,000
Sweden.....		5,300,000
Spain.....		18,500,000

The yearly consumption in kilograms per head of the population, based on the production of pig iron, and also taking into consideration the export trade in machinery and in other iron ware for the various countries at the present time, may be taken as follows:

	Kilograms.
United States.....	320
Great Britain.....	220
Belgium.....	160
Germany.....	145
France.....	65
Austria.....	50
Hungary.....	25
Russia.....	25

The Production of Coal.

The measure of the industrial condition of a country depends less on the production of iron than on the production and consumption of fuel. It may be remarked that the degree of general industrial activity of the countries named below is proportional to the figures given for the consumption of coal, which agree, except for a few small differences, with the proportions given for the production of coal, calculated per head of the population. These figures therefore afford a measure of the economical conditions of the civilized countries mentioned. The production of coal of the various countries for the year 1906 was as follows:

	Metric tons.	Metric tons.
United States.....	375,500,000	193,500,000
Germany.....		
Including: Coal.....	137,100,000	
Brown coal.....	56,400,000	
Great Britain.....		255,000,000
France.....		34,300,000
Including: Coal.....	33,600,000	
Brown coal.....	700,000	
Russia.....		19,600,000
Austria.....		37,700,000
Including: Coal.....	13,500,000	
Brown coal.....	24,200,000	
Belgium.....		23,600,000

The yearly consumption of coal per head of the population in these various countries is given in kilograms in the following table:

	Kilograms.
Great Britain.....	4,680
United States.....	4,050
Germany.....	3,140
Belgium.....	2,980
Austria.....	1,370
France.....	1,190

With regard to the production of coal in Austria, it must be stated that the greater part of the output consists of brown coal, so that if the calorific value be taken into consideration, the production of coal of Austria can be approximately estimated as equal to that of France. The demand for coal in Austria-Hungary is not fully met by the output of the country, and at the present time about 7,500,000 metric tons of bituminous coal are imported, against an export of 8,100,000 metric tons, of which, however, only about 900,000 metric tons are bituminous coal, and 7,200,000 metric tons are brown coal. If not only the weight, but also the calorific value, be included in the calculation, the import exceeds the export in fuel value.

The prosperity of the Austrian iron industry is not only impaired by the want of mineral fuel, but also by the circumstance that it can only be brought to the principal producing works by costly methods of transport. The pig iron producing centers of Bohemia and Styria are situated in localities possessing rich supplies of iron ores, and have at their disposal, on the spot, extensive deposits of coal. They are, however, entirely without coking coal, and depend on the import of coke from the Mährisch-Ostrau, Prussian-Silesia, and Westphalian coal fields. The Ostrau pig iron producing center, on the other hand, possesses an ample supply of coke; but has to obtain its ores chiefly from Hungary, which renders them expensive, owing to the high railroad freight charges. The blast furnaces situated in the Southern parts of the monarchy, such as Bosnia, possess large deposits of ore, but mineral fuel is wanting. Throughout the whole of Austria there are no blast furnaces which have both ore and coke on the spot.

If, in spite of this want of mineral fuel, in spite of circumstances conspiring to increase the cost of production, and that either the fuel or the ore can only be brought to the producing centers by costly routes, and in spite of the limited demand from a large portion of the empire, the Austrian iron industry has been able during the last 25 years to keep pace relatively with the other iron producing countries, this can be attributed to three reasons: Firstly, to the sufficiency of the protective import duties, behind the wall of which a prosperous development of the iron industry has been possible; secondly, the association of the iron works into a syndicate, whereby ruinous competition has been prevented; and thirdly, the concentration of the smaller works into larger units. By these two last mentioned means the adoption of more economical methods of working has been rendered possible.

Austria's Protective Duties.

The protective duties of several countries are given as follows, in order that the duties prevailing in Austria may be more clearly appreciated:

Duty Per Metric Ton in Crowns.

	United States.	Germany.	France.	Austria-Hungary.
Pig iron.....	19.4	11.7	14.3	15
Rough plates.....	54.4-108.8	58.5	71.4	90
Girders.....	54.4	29.3	47.6	70
Rails.....	38.1	29.3	57.1	60
Iron bars.....	65.3-87.0	29.3	47.6	60

Should any one feel astonished and filled with envy at the height of the duties protecting the Austrian iron industry, and at the high prices obtained in the country for iron manufactures, it must be remembered that a large share of the profit is absorbed by the State and other corporations, such as land, district, and Commune, in the form of taxes and rates.

As an illustration of this it may be instanced that the Prager Elser-Industrie-Gesellschaft, together with the Böhmische Montan-Gesellschaft, during the last eight years, a period contemporaneous with that of the application of the new taxes, paid to the State and to the

other corporations mentioned 21,840,000 crowns, and to the shareholders 62,650,000 crowns; so that the former, which enjoy practically the position of preference shareholders without having had to provide any capital whatever, received more than one-fourth of the resulting profit, while on the other hand the real shareholders, who undertake the entire risk, received less than three-fourths. According to the peculiar construction of the rating law, it has even happened that in one year the shareholders of the Prager Eisen-Industrie-Gesellschaft received in dividends 3,877,500 crowns, while the State and corporations received 4,116,107 crowns.

In this regard the Elysian fields must not be sought for in Austria, but are to be found in the United States, where the iron industry, working under the most favorable conditions, both of production and protection by high duties, is so little liable to public taxation that, according to authentic reports, a contractor who in one year had obtained a net profit of \$1,500,000 only had to pay \$6000 in public taxes.

Home and Export Trade.

As a result of the import duties protecting the Austrian iron industry, this country is completely closed to foreign iron; and thus we see that, while only 25 years ago a considerable proportion of the home consumption, even for those manufactures in which high quality was imperative, had to be drawn from foreign countries, at the present time home products take their place.

Twenty-five years ago the inland railroads purchased the greater part of the tires required, especially for passenger locomotives, in foreign countries; at present we find none but home manufactured tires in use. At that time in the workshops English tool steel was the most prized, but now it has been completely superseded by the highest qualities of steel made in Austrian steel works. Formerly the Austrian War Office purchased cannons, projectiles and armor plates from the leading producers of foreign countries, and the warships of the monarchy were almost entirely built of foreign materials; at the present time home manufacturers of armor plates, of cannons and of projectiles, whose products do not need to fear comparison with those of any other country, are available; and warships of the most modern construction, whose parts from keel to top mast are manufactured in home workshops, navigate our seas.

Thus in the last 25 years Austria has made herself entirely independent of foreign countries, both as regards quantity and quality of the iron manufactures required in the country. The system of protective duties has therefore completely fulfilled its principal object.

During this period, as already mentioned, the Austrian iron industry has combined to form a syndicate which embraces nearly all the branches of the iron trade. By this means it has been possible to utilize the full advantages of protection, not only to protect the home market from foreign invasion, but also to obtain an opportunity in providing a share, if only a modest one, for the markets of the world.

How greatly the conditions in this respect have changed during the last 25 years can be best ascertained from the fact that in the year 1895 the imports of iron and of iron manufactures amounted to 230,000 metric tons, against an export of scarcely 40,000 metric tons, so that the imports exceeded the exports by over 190,000 metric tons. In the year 1906, 120,000 metric tons of iron and ironware were imported, against 240,000 metric tons exported, so that the difference in favor of the export was 120,000 metric tons.

In 1895, 174,000 metric tons of pig iron were imported, and only 9000 metric tons were exported. Up to the year 1906 the importation of pig iron declined to 62,000 metric tons, and the exports increased to no less than 74,000 metric tons.

The Results of Consolidations.

As already stated, the Austrian iron industry during the last 10 years has welded together the smaller scattered iron works into larger units in many cases, whereby in combination with the division of production by the Syndicate, the possibility of adopting more economical methods of working has been attained.

It is exactly 25 years ago that, to take an example, the Oesterreichische Alpine Montan-Gesellschaft was formed into nine concerns, which then comprised 33 producing plants, and produced yearly 165,000 metric tons of pig iron and 620,000 metric tons of coal, and employed 17,500 men. The same concern produces at the present time 470,000 metric tons of pig iron and 1,200,000 metric tons of coal, and only employs 13,400 men.

To what extent the conditions in Austria have rendered imperative the division of labor, made possible by the organization of the Syndicate, and the concentration of the producing works, is best seen from the fact that the average annual output of girders in Austria during the last ten years was only 95,000 metric tons, and at the present time is not higher than 150,000 metric tons, in the production of which five works participate; or in the fact that the demand of the Austrian railroads for rails amounted during the last 10 years to an annual average of not more than 80,000 metric tons, and at the present time this quantity is not exceeded, the production of this small quantity being divided among five iron works.

Theorists express the opinion that protective duties and trade syndicates hamper technical progress, because they put into the pockets of those interested abundant profits without any trouble. Opposed to this view, the Austrian iron masters can with pride point out convincingly that such a theory is devoid of foundation, because they are always endeavoring to improve their works technically. The Austrian iron works have utilized all the modern methods for economical working, although they have been naturally limited, because their plant and appliances require to be suited to a great variety of manufactures, and must be designed to suit the comparatively small consumption of the country. The Austrian iron industry has therefore to avoid mere slavish imitation of the gigantic works in the United States, and has modified modern methods to suit the given conditions.

Finely Diversified Product Hampers.

It is quite a different thing to erect a rail rolling mill which has a yearly production of 800,000 metric tons, as is done in the United States, and to arrange, as is the case in this country, that five iron works shall share between them one-tenth of this production, and at the same time be forced to produce rails, girders, sleepers and similar material in one and the same mill. Though the Austrian iron works endeavor to turn to account all appliances which are intended to effect a saving of manual labor, yet things are not in many cases carried so far in this direction as in the American works, which are influenced by the scarcity of workers and the high wages. While in that country the demand for labor is met by immigration, a mighty living stream flows from our monarchy, specially from the other half—Hungary—where the emigration is facilitated by the Government; and it is greatly to be regretted that our empire stands at the head of those countries which provide the rest of the world with workers. During the year ending with June 30, 1906, the number of emigrants amounted to 265,000, of whom 153,000 came from Hungary. During the month of March of this year alone, 43,000 persons emigrated from Austria-Hungary to the United States, of whom 27,400 were Hungarians. With these figures our monarchy even surpasses Italy, which up to recent times had furnished the largest contingent of emigrants.

If, then, you consider the various centers of production of the Austrian iron industry, you must, in forming opinions as to whether the plant and the improvements adopted represent the most modern requirements or not, continually keep before you the conditions depicted, and specially consider that the consumption of iron is very limited; that a production of large quantities attainable by the most intense specialization as is to be found in the United States, in Great Britain and Germany, appears to be out of the question; and that the Austrian iron works are obliged to divide their proportionately small productions into a considerable number of different manufactures.

Taking into consideration all the local conditions, the Austrian iron works believe that they have done with

regard to technical progress the best possible, and await your judgment with tranquility.

Blast Furnace and Rolling Mill Progress.

You will find that where the conditions exist for a larger production of pig iron, at the Oesterreichische Alpen Montan-Gesellschaft, and also in Witkowitz, blast furnaces with a daily production up to 450 tons are equipped with all the most modern appliances, such as automatic charging apparatus. You will find the most complete utilization of blast furnace gases as, for example, in the Königshof iron works of the Böhmsche Montan-Gesellschaft, where blast furnace gas engines of more than 6000 hp. are installed, by which not only the blowing engines, but also the rolling mill for rolling sheets (the most important in the monarchy) are wholly driven. You will be able to observe the greatest possible utilization of other by-products of the blast furnaces and steel works; you will find the slags rich in phosphorus in Kladno and Königshof converted into artificial manure; at Witkowitz, Kladno and Königshof, the blast furnace slags are manufactured into slag bricks and slag cement, and the slag cement works at Königshof are the largest of the kind on the Continent.

You will find everywhere the most extensive application of electricity, mostly in conjunction with blast furnace gas engines, and also coke oven gas engines for the generation of power, and as an example, in Witkowitz a plant of this description of 5700 hp. exists.

It should here be noted that at the Austrian blast furnaces, which yield 790,000 c. m. of gas per hour, 263,000 c. m. are used for blast heating, so that 527,000 c. m. are available. Of this quantity, at the present time 358,000 c. m., or 68 per cent., are utilized for boiler heating, and 34,000 c. m., or 6.5 per cent., representing 12,000 hp. in gas engines, while the remainder of the gas is used partly for ore roasting or in drying kilns, and partly drawn off unutilized. The Böhmsche Montan-Gesellschaft, which at present is utilizing blast furnace waste gases on the most extensive scale, utilizes 23 per cent. of the available gas in gas engines.

In the Austrian coke works the coke ovens yield 86,000 c. m. of gas per hour, of which quantity the coke ovens themselves absorb 62,000 c. m., so that 24,000 c. m. are available. Of this quantity, 5700 c. m., or 24 per cent., are utilized in gas engines, while the remainder is used for boiler heating.

The most complete application of electricity to the driving of rolling mills will be shown to you in Teschen, where, as is well known, not only the finishing, intermediate and roughing trains, but also the reversing rolling mills are driven by electric motors. It must be recorded that as early as 1897 in Servola, Trieste, the Krainische Industrie-Gesellschaft at their blast furnace plant installed an electric ship loading crane on the American Brown system, to serve a blast furnace with a daily output of 250 tons.

It will also be brought to your notice that the Austrian steel works engaged in the manufacture of alloy steels of great value, especially tool steel, have also lately adopted the new electric processes.

Thus we find that the Poldihütte have adopted the Kjellin process, the firm Gebrüder Bohler & Co. are introducing the Ch. A. Keller electric arc process, and the new Styrian cast steel works of Danner & Co. employ the Héroult process; the Kärntnerische Eisen- und Stahlwerks-Gesellschaft have also decided to adopt the Héroult process at their works in Ferlach.

You will find many other things which will repay your attention, and will show you that the Austrian producers of iron have spared no trouble to maintain the position of their works at a high standard of technical equipment. It must, however, be repeatedly remarked that the Austrian iron works can never neglect existing conditions, and I must ask you when judging our plants to continually bear in mind the special conditions, which are, that the Austrian iron industry does not possess sufficient coke, that it must be brought from great distances at a great expense to where the ore is found, or the reverse, that the ore must be transported in a similar costly manner to the coke ovens, and that the output which the home market requires is comparatively small, so that

manufacture in bulk and a specialization of the rolling mill equipment appears to be entirely out of the question.

The lack of specialization in many cases prevents an extreme supersession of manual labor and the application of arrangements to attain this object, which appears to be less necessary in Austria than in those countries where wages are high, and where the necessary labor is wanting.

Future Ore Supply.

The Austrian iron industry looks forward to further future extensions with hopeful confidence, the more because I believe in the prediction which the past president of the Iron and Steel Institute, R. A. Hadfield, made in his brilliant address in the year 1905-6, that within a measurable time the world's production of iron, owing to the lack of iron ore, will be unable to satisfy the demand. Mr. Hadfield gives the amount of iron ore in sight as 10,000,000,000 tons, a supply which at the rate of consumption observed during the last 25 years, would be exhausted in about 40 years. There is no danger that in 40 years the world will suddenly be without iron, for the discovery may confidently be expected of many at present unknown deposits of iron ore in the undeveloped districts of eastern Asia and Africa; it is, however, certain that the increase in production of pig iron must attain a limit within a measurable space of time.

These conditions may similarly be experienced in Austria at a not very distant date. In another 25 years many important deposits of ore in Austria and Hungary will be exhausted; for instance, those Bohemian deposits of ore which the blast furnaces of the district charged altogether with ores rich in phosphorus, so that they will be obliged to fall back to other existing deposits, which, owing to their low percentage of iron and high percentage of silicon, cannot at the present time be smelted with economy. In the South of the monarchy, in Bosnia, there are still undisturbed deposits of ore, and the Styrian Mountain of ore certainly represents an almost inexhaustible source of supply. But all these auxiliary sources can only serve to keep the Austrian iron industry at a certain level, without rendering any considerable rate of increase possible.

On the other hand, the consumption of iron increases progressively, so that I consider that the time is not very remote when the Austrian iron industry must renounce its share of the supply of the world's market, while afterwards—according to my opinion, after scarcely 25 years—foreign iron will be imported to satisfy the demands of the home market.

The Département of Agriculture reports that the condition of corn on October 1 was 78 per cent., as compared with 80.2 per cent. on September 1 and 90.1 on October 1, 1906. The indicated corn crop is 2,491,715,000 bushels, against the September estimate of 2,540,764,000 bushels and the 1906 harvest of 2,927,416,091 bushels. The average yield of spring wheat is 13.1 bushels per acre, as compared with 13.7 bushels for 1906 and 14.7 bushels for 1905. The production of spring and winter wheat combined is about 625,567,000 bushels, compared with 735,260,970 bushels as estimated for a year ago. The average yield of oats is about 23.5 bushels per acre as compared with 31.2 bushels for 1906. A total yield of about 741,521,000 bushels is indicated, as compared with 964,904,522 bushels as finally estimated in 1906.

About a month ago, the Carnegie Steel Company appointed a committee consisting of Thomas McDonald, general superintendent of the Ohio Works at Youngstown, Ohio, Homer D. Williams, superintendent of the Duquesne steel works and blast furnaces at Duquesne and J. S. Unger of Pittsburgh, to visit various plants making firebrick, silica brick and magnesite brick, and arranged to secure from them 20 samples of each brand of brick made in five consecutive days. The fire brick manufacturers have complied with this, and it is understood that the committee gathered a good deal of valuable information relative to the qualities of the products of the different interests.

Ball and Roller Bearings.—I.

The Use of Separators to Reduce Friction.

BY J. F. SPRINGER, NEW YORK.

In the ordinary and simplest ball and roller bearings there is a sliding friction between the balls or rollers. Between balls there is a point contact and between rollers a line contact, and the opposing motions creating friction are tangential to the contacts, as indicated in Fig. 1, which represents a transverse section of either an annular ball bearing or a straight roller bearing. Assuming the shaft quiescent and the outer raceway driven in the direction of the arrow, rolling motion is imparted to the balls or rollers, indicated by their arrows. It will be seen that at all points corresponding to the contact between A and B there is sliding friction.

Since two tangent circles have their point of contact in a straight line with their centers, whatever pressure is exerted between the balls or rollers A and B is along the line *a b*. If there is no appreciable pressure the sliding friction is negligible, but if the pressure, and hence the friction, is considerable it becomes important to eliminate the sliding friction. In many of the numerous devices having this end in view it is sought to exchange the sliding for rolling friction, which seems to be the logically correct procedure. Between the balls or rollers A and B, Fig. 2, is interposed a rolling member, C, which, being of smaller diameter, has no direct part in carrying the load. This separator may be a ball or a roller, irrespective of which A and B are, and by contact with the latter is rotated in a direction opposite to theirs. All parts roll together and no rotations resist one another.

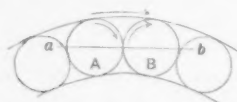


FIG. 1

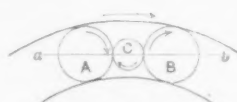


FIG. 2

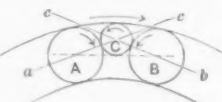


FIG. 3

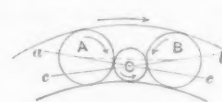


FIG. 4



FIG. 5

Diagrams Illustrating the Use of Separators in Ball or Roller Bearings.

If a device of this sort does not introduce some other source of friction or some objectionable feature it would seem to be ideal. A possible source of friction, however, may be introduced by the device itself. In a full raceway the circuit pressure is in the direction of the line *a b*, Fig. 1. Similarly, when a rolling separator, C, is interposed, the pressure exerted upon it by A is in the direction of the line *a c*, Fig. 3, and the pressure transmitted, in turn, from C to B is in the direction of the line *c b*. The lines *a c* and *c b* coincide in *a b*, Fig. 2, because here the center of C is in a straight line with the centers of A and B. Obviously, when *a c* and *c b* do not coincide the separator tends to move in the direction of the outer raceway, as in Fig. 3, or in that of the shaft, as in Fig. 4, according to whether the center of C falls to one side or the other of the line joining the centers of A and B. Unless some retaining device prevents, the separator will either be forced against the outer raceway, as in Fig. 3, with which it will have a sliding contact, since its rotation opposes that of the raceway, or it will be forced against the inner quiescent raceway, as in Fig. 4, and slide, because its rotation resists its bodily direction. It is to be particularly noticed that this sliding friction is under pressure practically equal and comparable to the original circuit pressure between A and B, Fig. 1. If this was considerable then the mere separation of the bearing balls or rollers has brought about no special reduction.

In a journal bearing, where the load comes upon but one side at a time, the region of actual pressure due to the load is only, say, 70 or 75 degrees. The more the balls or rollers are separated the greater the probability that when one is under load the other is emerging from that condition. In the case of crowding this circumstance would have the effect of relieving circuit pressure or diminishing the time of its continuance. But over against this must be set the fact that separation means fewer bearing parts and consequently increased load on each.

As the circuit pressure increases with this load pressure, it is probably safe to assume that widening the space between balls or rollers effects no special improvement in circuit pressure conditions.

Little or no gain then results from the arrangements shown in Figs. 3 and 4, for sliding friction still exists and under pressure. There is, however, a way of placing the separators so that the apparently inevitable slide occurs in the absence of appreciable pressure. Incidentally this is illustrated in Fig. 2, where the lines of circuit pressure *a c* and *c b* coincide in *a b*, and the separator has its center in line with the centers of the adjacent bearing balls or rollers A and B. In this condition the circuit pressure from A to B has no tendency to force C out or in, and no appreciable sliding friction will exist in whatever means is used to maintain the separator in position, since the sliding contact will not be under pressure.

Some inventors and designers have used a non-rolling separator, which, in the opinion of the writer, is of questionable advantage. The slide remains, and is under pressure. As will be seen from Fig. 5, while there is no sliding contact between the balls or rollers, it has only given place to two slides where they touch the separator, and these slides occur under pressure. It has been held that sliding friction is independent of velocities of the contacting surfaces, depending only upon pressure and character of the materials. If this be true, then apparently a non-rolling separator accomplishes little or nothing. Even if the amount of each separation equals the diameter of the balls or rollers, the total number of sliding contacts in circuit will be the same as with no separators and only half as many balls or rollers can be used, consequently each will have to do double duty in supporting the load. Thus the bearings shown in Figs.

1 and 5 will have the same number of sliding contacts, but the first provides twice as many load supporting balls or rollers as the second.

The writer, however, inclines to the opinion that velocity does affect the amount of sliding friction. This would seem to be indicated by the cutting ability of rotating disks, which increases with their velocity; a disk will cut a material harder than itself if it be given sufficient velocity. The interposition of non-rolling separators does reduce the velocity of the contacts under circuit pressure, as can be seen from Figs. 1 and 5. In Fig. 1 the surface velocity of the balls or rollers is the same as that of the outer raceway, hence the relative motion at the contact between A and B is double that velocity. In Fig. 5, as the separator does not roll, the relative motion at the contacts with the bearing balls or rollers is of the same velocity as that of the outer raceway. This may be advantageous, but it must be remembered that to effect this reduction of the velocity involves reducing the number of balls or rollers. Since this reduces the load capacity of the bearing as a whole, it may well be questioned whether the gain effected is worth the sacrifice required to obtain it. The writer would not wish to be interpreted as condemning non-rolling separators indiscriminately. In ball bearings he sees little if any net gain in using them. In roller bearings, however, where it is necessary to maintain the rollers in correct alignment, such separators may be advantageously used as part of the means accomplishing this purpose.

Recapitulating, it would seem that if the sliding friction arising from the mutual contact of balls with balls or of rollers with rollers under circuit pressure should be eliminated, the best way to do it is to interpose separator balls or rollers with their centers in line with the centers of the bearing balls or rollers they separate.

A subsequent article will consider whether or not the circuit pressure is ordinarily negligible.

The Case Hardening of Steel.*

BY G. SHAW SCOTT, BIRMINGHAM, ENGLAND.

The process known as case hardening is one which consists of adding such a percentage of carbon to a relatively thin outside layer of iron or mild steel as will on correct quenching produce a hardened surface, while the inner core of the metal still retains its initial character.

Case hardening is conducted in practically all engineering works, but, generally speaking, it appears that comparatively little is known of the theory of the process by those who practice the operation, and up to quite recent years crude rule of thumb methods were almost universally applied. The production of satisfactory case hardened material is a matter of supreme importance to many engineering undertakings, and especially to such industries as cycle and motor car making, in which there is often required very hard, yet tough, material in order to obtain satisfactory results in every day use.

Among the many mechanical parts produced by the above industries which require to be case hardened are free-wheels, chains, gudgeon pins, roller and ball bearings, bushes, parts of camshafts, steering gear pins, gear wheels of all kinds, valve levers, &c.

Processes Allied to Case Hardening.

Case hardening is fundamentally the same as the older process of cementation, the chief points of difference being that in case hardening a different carbon conveying material is used from that generally employed in cementation, while in the latter process the carbon is allowed to penetrate through, or nearly through, the bars, and is not interrupted so as to form merely a surface or "case" of carburized metal. Case hardening is somewhat allied to the Harveyizing and Krupp processes, both of which are employed for the hardening of armor plate. In the former process a solid carbonaceous cementing material is employed, usually charcoal, and in the latter a gaseous hydrocarbon is stated to replace the charcoal.

Materials Used in Experiments.

1. Steel.—For the purposes of this research a variety of steel was selected, which has been found by experience in the trade to be especially suitable for case hardening. On analysis this steel was found to have the following composition:

	Per cent.
Combined carbon.....	0.14
Silicon	0.01
Sulphur	0.08
Phosphorus	0.03
Manganese	0.58
Iron (by difference).....	99.16
Total.....	100.00

The steel was delivered in lengths of about 3 ft., and had been rolled down to about 1/4-in. square. For experimental convenience each bar before being used was cut up into about nine smaller bars, averaging 4 in. in length, and, after being duly marked for future reference, the bars were stored for use as required.

2. Case Hardening Mixtures.—Of these many were tried, among which were included such materials as burnt leather (several varieties), wood charcoal, anthracite, sugar charcoal, mixtures of barium carbonate and wood charcoal. Owing to its almost universal use in trade circles in England burnt leather was employed as the standard case hardening material throughout the research. Two samples of this material in particular were tested, both of which have a considerable sale. They are subsequently referred to as mixtures "A" and "B."

Since preliminary experiments showed that there undoubtedly was a difference in the case hardening effect, due to the relative fineness of the carbonizing material, it was thought desirable first to ascertain the coarseness of the mixture used, and the following table gives the result of an examination of both "A" and "B":

	"A." Per cent.	"B." Per cent.
Does not pass 10 sieve.....	68.0	72.6
Does not pass 20 sieve.....	9.0	9.6
Does not pass 30 sieve.....	4.2	5.8
Does not pass 60 sieve.....	4.4	5.4
Does not pass 90 sieve.....	4.0	3.8
Does pass 90 sieve.....	9.4	2.6
Totals.....	99.0	99.8

From the above it will be seen that practically 75 per cent. of the material was comparatively coarse, and that there was rather a high proportion of very fine material in "A," as compared with "B." Sample "B" was found to contain a considerable amount of unburnt or only partly burnt material, and this is a feature in a case hardening material that does not tend to reliable work. Estimations of moisture and ash were made in the case of both these mixtures with the following results:

	Moisture. Per cent.	Ash. Per cent.
"A"	13.44	5.56
"B"	24.68	3.60

As a result of these experiments the mixture "A" was decided on as standard, and an estimation of the amount of nitrogen present was made by Kjeldahl's method, 1 g. of the material being digested with strong sulphuric acid. The acid solution was then heated with excess of sodium hydrate, and the evolved ammonia was absorbed in a known volume of standard acid and determined volumetrically. The mean of several results showed that nitrogen was present to the extent of 3.2 per cent. The composition of our standard case hardening material "A" can, therefore, be represented as follows:

	Per cent.
Carbon (by difference).....	77.80
Nitrogen	3.20
Moisture	13.44
Ash ..	5.56
	100.00

3. Boxes.—For the purpose of heating the experimental bars in contact with the case hardening mixtures a number of iron boxes were cast in the Birmingham University Foundry. Their length inside was 4 in.; breadth, 2 in.; depth, 1 in., and thickness, 1/4 in. Boxes made of fire clay were used in preliminary tests, but the cast iron articles were found to be much more satisfactory.

4. Muffles.—These were of a recent Morgan type, heated by Mond gas, and capable of giving a temperature of 1000 degrees C. The temperature of the muffles was recorded by means of a direct reading Baird & Tatlock thermo-couple pyrometer, the accuracy of which was frequently tested by the usual methods.

The Influence of Temperature.

The first experiments dealt with the influence of time and temperature upon carbon absorption, employing the standard mixture "A," of which the composition has already been given.

In connection with case hardening temperatures, it may be pointed out that Mr. Osmond's work has shown that iron does not absorb carbon to any considerable extent below the recalcrescence point Ar_3 , or, in other words, that the lowest practicable temperature, using pure iron and pure carbon, will be not much below 900 degrees C., a statement which was checked as follows: Bars were heated for 4 hr. at 700 degrees C. in "A," and subsequent microscopic examination showed that absolutely no carbon penetration had taken place. A slight penetration to the depth of 0.13 mm. was observed after similar treatment at 800 degrees C., while at 900 degrees C. the depth of carbon impregnation had increased to 1.58 mm. A photomicrograph showed the carbon penetration resulting from this experiment, the ferrite, which showed white originally, disappearing. The case hardening was about 1-16 in. deep, the "case" containing approximately 0.89 per cent. carbon.

At 1000 degrees C. the depth of penetration was found to be more than twice that obtained by case hardening at 900 degrees C. for an equal length of time. At temperatures higher than 900 degrees C. the danger of

* From a paper read at the Vienna meeting of the Iron and Steel Institute, September, 1907.

overheating the metal was evidenced, and the carbon absorption became both "harsh" and irregular. For normal case hardening a "case" should be obtained which contains a percentage of carbon equal to that of the pearlite eutectoid, viz., 0.89 per cent. With more carbon the "case" in its "normal" or unhardened condition shows cementite as white rivers surrounding the larger masses of pearlite when the polished surface of the specimen has been etched with a solution of picric acid in alcohol. The presence of much cementite is generally regarded as unsatisfactory in case hardened articles.

The Influence of Time.

We now proceed to consider the effects of using various mixtures for differing periods of time, the uniform temperature of 900 degrees C. being employed throughout the series. Using specimens 3 in. long and 6.5 mm. square sections, the following figures were obtained:

Time of heating. Hours.	Burnt leather "A." Millimeters.	Wood charcoal. Millimeters.	Barium carbonate and wood charcoal. Millimeters.
2	1.15	0.72	1.36
4	1.58	1.07	2.20
8	2.30	1.58	2.84
12	2.80	1.80	3.17
16			

Right across specimen.

It will be seen that the most rapid penetration took place when using the mixture consisting of barium carbonate and wood charcoal, while the least penetration resulted from the use of wood charcoal. However, when the heat was sufficiently prolonged the several mixtures gave approximately the same results.

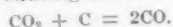
Non-Nitrogenous Materials.

Case hardening materials, as previously stated, are varied in character, and include such substances as wood charcoal, potassium, ferrocyanide, potassium cyanide, petroleum gas, bone, horn, graphite, burnt leather, bone black, acetylene, barium carbonate and charcoal, coal gas, sugar charcoal, &c. What is most noteworthy in connection with this list is that of all the materials mentioned, those that give the most rapid case hardening effect either contain nitrogen in some form or other, or else have the power of utilizing atmospheric nitrogen. The effects of nitrogen on case hardening are exceedingly important and will be discussed later.

In the case of a nonnitrogenous material, such as sugar, charcoal or anthracite, it is usually assumed that the case hardening action comes about in the following way: Air in the cementing box unites with the carbon, forming carbon monoxide, which gas reacts upon the iron, thus:



The liberated carbon dioxide acts upon a further portion of carbon producing still more of the monoxide:



Thus the process is continuous, and the carbon monoxide will continue to carry carbon into the metal until the latter becomes saturated. It was, however, shown by Sir W. Roberts-Austen that pure iron and pure carbon can unite without any intermediate action of carbon monoxide, while Professor Arnold considers that the subcarbide (Fe_3C) plays an important part in the carburization of iron or steel.

As regards cyanides, these are not much used for case hardening, except for small work that requires merely a skin hardness, but a mixture which may depend upon cyanogen products for its effectiveness has been successfully adopted by Dr. Guillet in France. This consists of 60 per cent. of wood charcoal and 40 per cent. of barium carbonate, and its effectiveness has been substantiated by the author of this paper, as is shown by the figures already given.

Dr. Guillet suggests that this increased case hardening effect is due to some property of barium carbonate which enables it to absorb nitrogen with the formation of an effective cyanide of barium. Braune has also observed the value of nitrogenous cementing materials, and has shown that with iron containing 0.35 per cent. carbon the nitrogen content in the "case" increases from 0.01 per cent. before cementing to 0.07 per cent.

after cementing, but that this large increase occurs only as a result of employing a nitrogenous substance, such as bone charcoal. When using wood charcoal it appears that the nitrogen increases only from 0.01 to 0.024 per cent. According to Braune, whatever cement be used the effect of subsequent reheating is to cause a gradual diminution in the amount of nitrogen in the metal, and so long as the amount of this gas does not exceed 0.035 per cent. the metal will not be brittle.

Some of the above figures, as given by Braune, have recently been contested by two Swedish chemists, Pettrén and Grabe. The latter maintains that all Braune's nitrogen figures are too high, since sufficient precautions were not taken to observe that the reagents used were free from ammonia. *Inter alia* it was shown that cast crucible steel contained more nitrogen than open hearth steel, for the reason that the former was made from cemented iron, which had been in contact for a prolonged period and at a high temperature with a slightly nitrogenous material—wood charcoal. In the same paper it is shown that in cementing the nitrogen content increases proportionately with the increase of carbon, but only up to 1 per cent. carbon. The nitrogen is then at its maximum, 0.008 to 0.010 per cent., and further increments of carbon result in less nitrogen being absorbed.

Nitrogen and Case Hardening.

All the case hardening materials in common commercial use contain nitrogen in some form or other. It is obvious that unless practical experience had shown that nitrogen aided the process in some way no one would think of using a costly nitrogenous material in place of charcoal or anthracite, these being well-known possible substitutes, which cost only as much per ton as burnt leather costs per hundredweight.

To prove how slight was the effect (measured by carbon penetration) of heating our standard steel bar with materials other than those which contain or supply nitrogen, experiments were made with anthracite, and also with good hard coke. The carbonaceous material in each case, together with the bar to be treated, was packed gently in one of the special iron boxes prepared for the research, and after being carefully luted down the box was heated in a muffle for 4 hr. at 900 degrees C. After this heating it was found that there was penetration to the following extent:

- (a) Anthracite 0.15 mm. on 6.5 mm. bar.
(b) Best hard coke 0.16 mm. on 5.5 mm. bar.

As a result of heating a bar under exactly similar conditions, but using as a carbonizing material burnt leather "A," instead of the above, a penetration of 1.58 mm. was obtained. From this it will be seen that the effect of the nitrogenous mixture was to increase the depth of penetration during the initial stage of case hardening in the ratio of about 10 to 1. Hence it will be recognized that nitrogen must play a very important part in the process of case hardening. As a result of the consideration of the above facts relating to the possible effect of nitrogen in conducing to rapid case hardening, further experiments were undertaken, which briefly were as follows:

Two exactly similar bars of standard steel were selected. One was heated in an atmosphere of ammonia for 4 hr. at 550 degrees C. The other meanwhile received no treatment. Afterward both were heated in separate cast iron boxes in a nonnitrogenous carbonaceous material (sugar carbon) for 8 hr. at 1000 degrees C. The mean figures of a series of these experiments showed that the "ammonia bar," as compared with the untreated bar, had received greater proportionate penetration in the ratio of 45 to 32. The high temperature employed was specially favorable to the nonnitrogenous material, and had the heating been conducted at a lower temperature the difference in all probability would have been still greater.

Subsequently an apparatus was made by means of which it was possible to pass dry ammonia into the case hardening box during the whole period of heating in the muffle. For this purpose one extremity of a piece of 1/2-in. gas pipe some 2 ft. long was screwed into the end of one of the boxes. The other extremity, which projected outside the muffle, was connected to an apparatus

for giving dry ammonia. In the same muffle as the above box and placed side by side with it was an ordinary box. Both were filled with sugar charcoal as a nonnitrogenous carbonizing medium, and among the charcoal several test bars were placed. For 4 hr. the muffle containing the two boxes was kept at 900 degrees C., a stream of ammonia being passed through the special box, escaping through a minute hole drilled in the lid. Afterward the boxes were allowed to cool, ammonia still passing into the special box. On subsequent superficial examination the "nonammonia" specimens were found to be bluish black in color and quite soft to the saw. On the other hand, all the ammonia treated bars possessed a distinct whitish luster and presented a tough outer skin to the saw.

Microscopic examination enabled the depth of carbon penetration in each case to be measured. This showed that whereas the bars which had received no ammonia treatment gave a penetration figure of 1.44 mm., those which had been treated with the gas had been penetrated by the carbon to the extent of 1.80 mm.

It will thus be seen that the result of the experiments was to show that ammonia did actually cause an increase of carbon penetration, but that the amount of this increase was perhaps not quite as great as might have been anticipated under the circumstances surrounding the experiment.

Ammonia Treatment of Bars.

Mention must be made of the peculiar results obtained by heating bars at a certain temperature in ammonia. After treatment with ammonia for 4 hr. at 550 degrees C. the bars showed a bright, silvery luster, and on microscopic examination a structure at the edge of each specimen was observed which showed very obvious "twinning." That twin crystals were not present in the bars before treatment was proved by repeated and careful microscopic examination at high powers of the original material.

A uniform structure was always observed right through the bar. To show that the "twinning" was not produced by the distortion of the bar by some mechanical strain a bar was held in the vise and bent backward and forward several times until fracture occurred. No twin crystals resulted from this treatment or from violent and rapid sawing or hammering. It is therefore evident that these twin crystals were not present in the original steel, nor were they induced by any subsequent mechanical treatment, but that they were produced by heating the bars for a more or less prolonged period at 550 degrees C. in an atmosphere of ammonia.

The Effect of Nitrogen.

As it appears to be abundantly clear that nitrogen in some form is necessary for the practical performance of case hardening, the question arises as to the manner in which nitrogen assists the rate of carburization. That the free gas itself has no effect upon steel has been proved, both by Guillet and by Braune. Ammonia, on the other hand, is absorbed by iron, and the experiments above recorded prove that it causes an increase in the rate of carburization when carbonaceous material is present. This latter fact suggests that ammonia itself, while being the prime agent in any change, may conceivably lead to the formation of cyanogen, and that this cyanogen may act upon the iron thus:



from which it will be seen that the cyanogen may act as a carrier of carbon to the metal to be carburized.

This, however, does not explain why carburization takes place at a lower temperature when nitrogen compounds are present. But it has been shown that after steel has been heated in ammonia "twinning" is observed. Now, since Osmond has shown that twinning can only result when iron or steel is in the γ condition, it is reasonable to assume that the metal has been changed from the α to the γ state. Under normal conditions metal at 550 degrees C would certainly be in the α condition. Nitrogen, we may conclude, should, therefore, be added to the list of elements which cause iron to take or retain the γ form. And, since γ iron combines more readily with carbon than does α iron, this action of nitro-

gen on the iron would appear to explain sufficiently its beneficial effect during the early stages of the process of case hardening.

The Hendey Machine Company's Improvements.

The Hendey Machine Company, Torrington, Conn., manufacturer of engine lathes, milling machines and shapers, has completed much of its extensive scheme of improvement and enlargement of its buildings and the increase and rearrangement of its manufacturing facilities. So comprehensive have been the changes that all of the wooden buildings have been replaced, and nothing is left of the plant as it was 11 years ago, except a small brick building, which serves for storage in connection with the foundry. At the same time the works have been so enlarged with the growth of the business that nearly 700 men are now employed.

In the new machine shop building, which has now been occupied, the unusual width of 110 ft. has been obtained without sacrifice of light, the overhead arrangement of glass flooding the main floor and those sections of the galleries which are not fully lighted from the broad and high side windows. The heating arrangement comprises three series of steam pipes, fed from exhaust steam, the pipes of the floor and galleries being next the wall, while the third series is at the top of the crane bay, which insures a uniformity of temperature, there being no loss to the lower air stratum, owing to the tendency of the warm air to rise. The building, in common with all of the company's new construction, is of heavy brick and steel construction, and the effort to secure thoroughly fireproof plant has been carried out in materials as well as in the sprinkler system. The building is 110 x 220 ft., and very high to permit of high studded galleries as well as the space beneath them. There is a basement story. The unusual width permits of a crane bay 50 ft. wide, served by a powerful Shaw traveling electric crane. Galleries extend around three sides, 30 ft. wide on the sides. The galleries are devoted to the shaper department and to polishing. The main floor is given over to the planers and other heavy machinery. There are facilities for loading directly on cars brought in on a siding.

At the rear end of this building a vacant space is being utilized for a brick and steel building of heavy construction, 33 x 100 ft., three stories. The first floor will constitute a shed for the storage of foundry supplies, the second will be the pattern shop and the third will be for storage. A 60-ft. extension of the foundry has been completed recently, and the power has been increased, electric power being used throughout the establishment.

The readjustment of departments in the grouping of machinery thus concentrating production and increasing the capacity in connection with new equipment has been very complete, so that an exceptionally high degree of efficiency has been obtained along the most modern lines of manufacturing practice. Each department has been arranged so that there will be room for expansion as the need shall require it. The work of leveling adjacent land has been begun, comprising extensive excavation, that the space may be available for extensions of the works when existing space shall have been exhausted. It is the company's plan to devote its best energies to the development of its milling machines and geared head lathes.

The German Steel Syndicate has made a contract with the Prussian State railroads for the requirements of track material during the three years beginning April 1, 1908. The base price is 120 marks per metric ton for rails, and 111 marks for steel ties.

The Warner & Swasey Company, Cleveland, Ohio, has opened a branch office in the Commercial National Bank Building, Adams and Clark streets, Chicago, under the management of E. B. Boye. The new office is in position to furnish information regarding the company's machine tools.

The Shepard Inclosed Electric Cranes.

As Built by the General Pneumatic Tool Company, Montour Falls, N. Y.

An explanation is desirable at the outset as to what is meant by the term "inclosed," as applied to traveling cranes, and what its object is. In the case of the Shepard electric cranes manufactured by the General Pneumatic Tool Company, Montour Falls, N. Y., it means the inclosing of all working parts, such as motors, gears, brakes and bearings, for the twofold purpose of excluding dust and foreign matter and retaining lubricant, so that these parts may either run directly in oil

cularly disposed for the sake of protection, lubrication and accessibility. All running parts, except the winding drum and truck wheels, are inclosed within the main frame, which at the same time affords them a compact and rigid support. A motor at one end of the frame, as seen in Fig. 1, operates the hoisting drum through the balanced drive, which is a distinctive feature of the Shepard cranes and hoists. A double train of planetary spur gears, shown partly disassembled in Fig. 3, gives three speed reductions in connection with two internal gears not shown. Thus the work is divided among double the number of teeth that would be employed in the ordinary arrangement, and the driving forces are balanced so that no side pressure is exerted on the shaft bearings. Because of this arrangement it is possible to

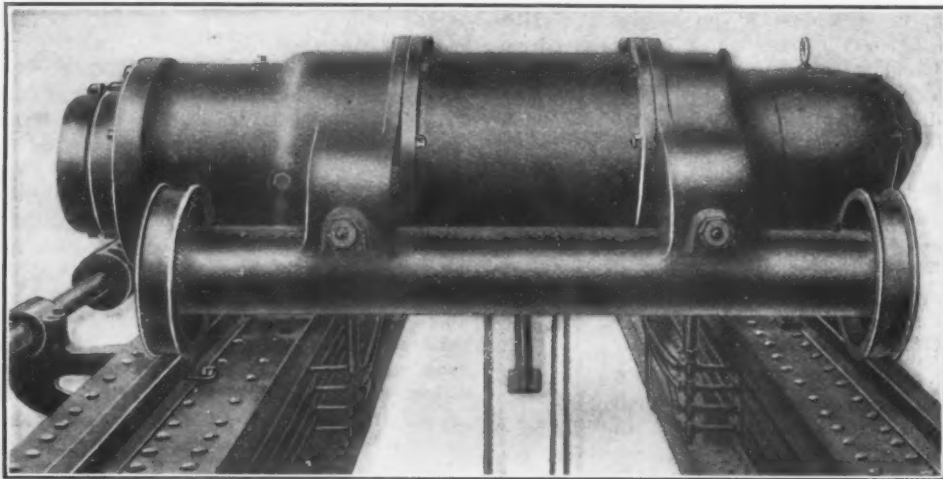


Fig. 1.—One Side of the Inclosed Trolley Which Is a Special Feature of the Shepard Cranes.

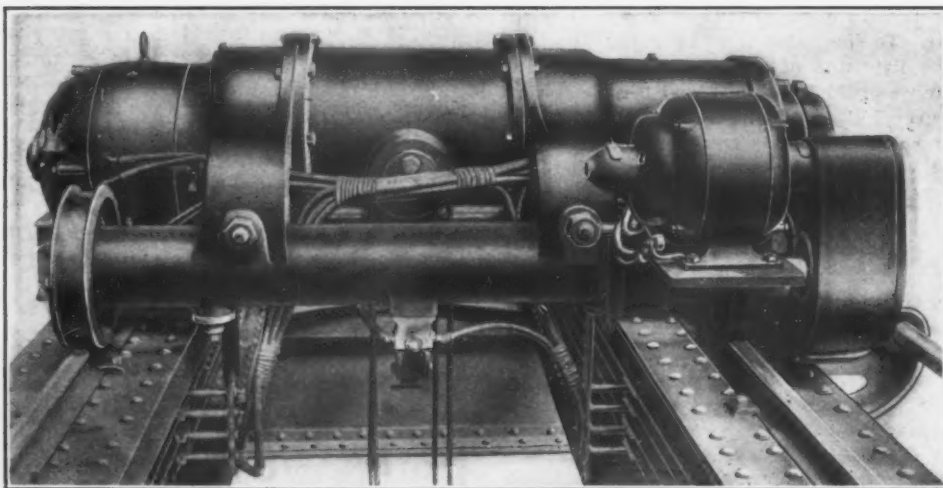


Fig. 2.—The Opposite Side of the Trolley, Showing the Trolley Driving Motor.

baths or be continuously supplied with an abundant amount of fluid oil and so be free from any dependence upon grease cups. The most unique part in the construction which is a consequence of the aim to inclose the operating parts is the trolley, views of the two sides of which are given in Figs. 1 and 2. It will be seen to bear little resemblance to familiar types of crane trolleys, and at once suggests serviceability in foundries or shops where dust, moisture or fumes necessarily exist. Even though the crane trolley is perforce located unfavorably for cleaning and inspecting, it is not of serious consequence when such thorough immunity from injury is provided and lubrication is a matter that will take care of itself for long periods without attention.

The Trolley.

Although so different from the usual forms in appearance, the trolley does not differ in manner of operation. The motors, electric and mechanical brakes and gears perform the customary functions, but they are pe-

use relatively heavy gears, and still place them with their shafts and bearings and the mechanical or load brake, in the compact barrel-like inclosing frame, where a common supply of oil serves all.

Slight inequalities in the trade, which are prone to impart a twisting effect to the trolley frame, with this construction cannot affect the alignment of the various shafts. None of the shafts extend through the walls of the casings, hence there are no opportunities for dust to enter or oil contained in the gear chambers to escape or evaporate. The bearings for the drum and other shafts are bored to correct relation with one another and are bushed with hard bronze, doing away with the need of adjustment, which would only be a probable source of disturbed alignment.

The manner of securing the gears, brakes, &c., in the cylindrical frame is interesting, as no screws, bolts, pins or keys are used. Bolting the cover in place secures all parts in proper position, and when necessary the parts

are very easily and quickly removed consecutively after removing the cover. It will be seen, therefore, that accessibility has been increased rather than sacrificed in inclosing these parts.

Being inclosed with the hoist gearing the load brake is afforded a constant bath of oil, which distributes the heat generated by the friction to the casing, from which it is readily radiated, and the brake is thereby kept re-

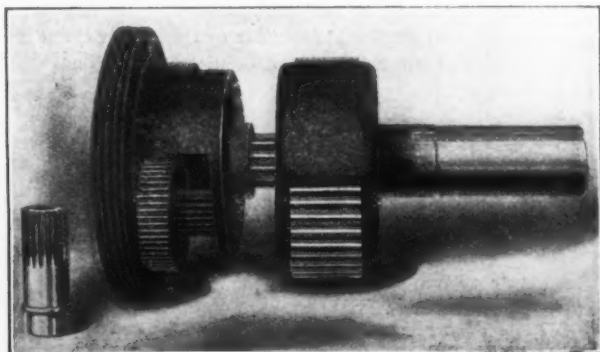


Fig. 3.—Parts in the Hoist Gearing.

more intimately associated with the hoist gearing and has no dependence upon the motor coupling, nor does it entail any complications in the motor arrangement, or tend to increase its temperature.

When the load hook reaches its upper limit of travel an automatic limit switch cuts off the current to the hoisting motor, and since this is not operated by a secondary electric circuit it cannot become inoperative because of any open circuit that would not stop the motor. After the limit switch has operated the load hook may be lowered immediately.

As indicated at the right in Fig. 2, the trolley driving motor is mounted on a bracket on the trolley frame. Through two spur gear reductions inclosed in an oil and dust tight case power is transmitted to one of the trolley wheel shafts. In this way a wheel on each of the trolley rails is positively driven. The gears are as thoroughly lubricated as in the hoisting mechanism, and an unusual and desirable feature is that they may be operated with the casing cover removed, allowing inspection of the parts in motion before inclosing them.

The Bridge.

The bridge driving motor is shown in Fig. 4, and also an end view of the trolley which may give a better idea

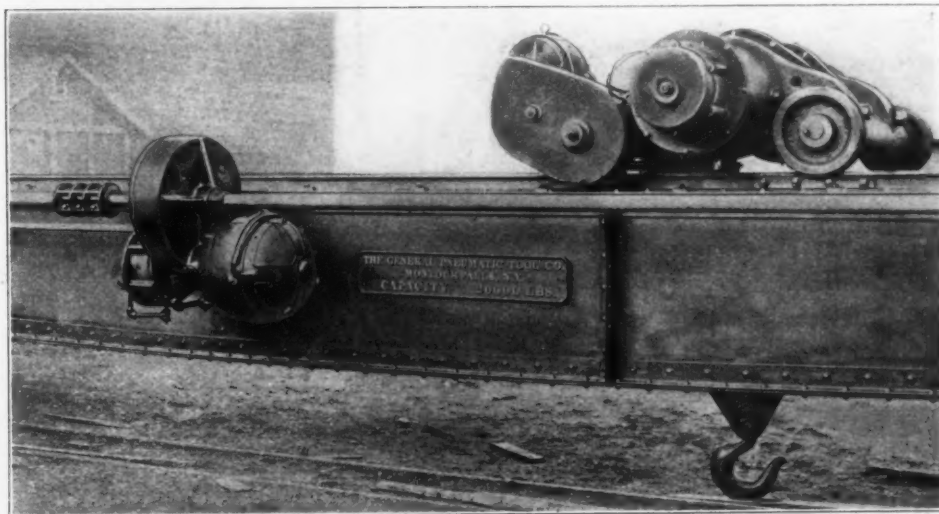


Fig. 4.—Detail Near the Center of the Bridge, Showing the Bridge Driving Motor and an End View of the Trolley.

markably cool. The importance of this is appreciated when it is considered that in lowering the load about 80 per cent. of the work done by the motor in hoisting reappears as heat, mostly developed by the friction surfaces of the brake. These surfaces of the brake are at rest while the motor is hoisting, as the hoisting motion is not transmitted through the brake, so that the brake consumes no power. Its surfaces being large, are subject to only moderate intensity of pressure, and the abundance of lubrication insures uniformity of action. The holding power of the brake is always slightly in excess of that required to sustain the load; some power is therefore required to lower the load. The pressure between the friction surfaces is a function of the speed, hence should the load tend to descend faster than the corresponding speed of the motor increased brake tension would be supplied until such tendency was counteracted.

The sole purpose of the electric brake is to immediately stop the hoisting motor when current is accidentally or intentionally cut off. While it is capable of controlling the descent of the load it is not intended for that purpose. It is of the Weston type, with alternating fixed and rotating disks of bronze and iron, the same materials as are used in the load brake frictions, and similarly runs in oil in a dust tight enclosure. The winding of the electric brake is protected from oil and is in series with the hoist motor, consequently the brake is compelled to release when current flows through the motor and bound to hold at all other times. Instead of being applied in the usual way directly to the motor, the electric brake is located at the other end of the trolley, where it acts on an extension of the motor pinion. In other words, it is

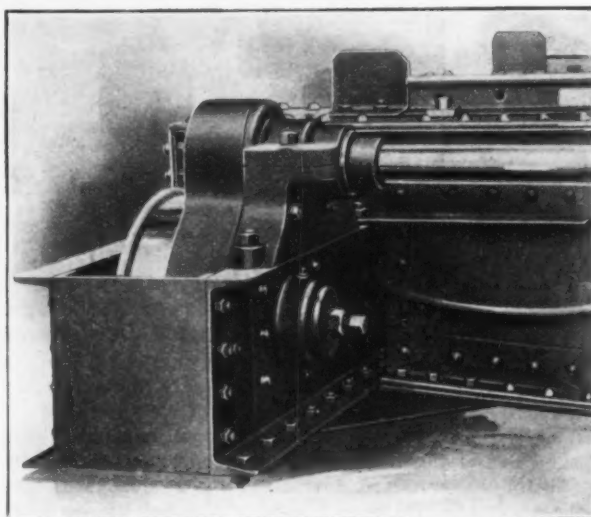


Fig. 5.—Detail of One End of the Bridge.

of its form. The bridge drive is applied near the center of the span, and the gears, as in the other parts, are inclosed in a dust and oil tight case. To this the motor is directly attached, so that the bearings of the bridge shaft and motor shaft are held in correct relation, preserving their alignment under all conditions, irrespective of the horizontal or vertical loading of the bridge or the heavy stresses sometimes set up in this gearing. The

motor and gears form a self-contained group of parts, requiring no support from the bridge other than that to sustain their weight, amply afforded by a single set of bolts. Removing the cover of the gear case exposes all of the gears, which as in the case of the trolley drive may be run with the cover off, allowing inspection under working conditions. This case is the first of those described that has a shaft projecting through its walls. The leakage of oil along the shaft, which is therefore inevitable, is counteracted by drainage channels leading back to the case, and dust collars in contact with the bearings exclude entrance of dust.

several hundred per cent. have been found in the holding power of the same brake under variable lubrication, hence the provision for constant lubrication.

There is not much unusual in the bridge or squaring shaft, except the size of the latter and the inclosing of its gears. The pinions at its ends mesh with gears bolted directly to the driven bridge truck wheels, removing tendency of these wheels to twist or turn on their shafts. A detail of one end of the bridge is given in Fig. 5. No oil bath is provided in the inclosures, as it is not necessary on account of the slow motion of the gears, and retention of the oil would be difficult because the shafts

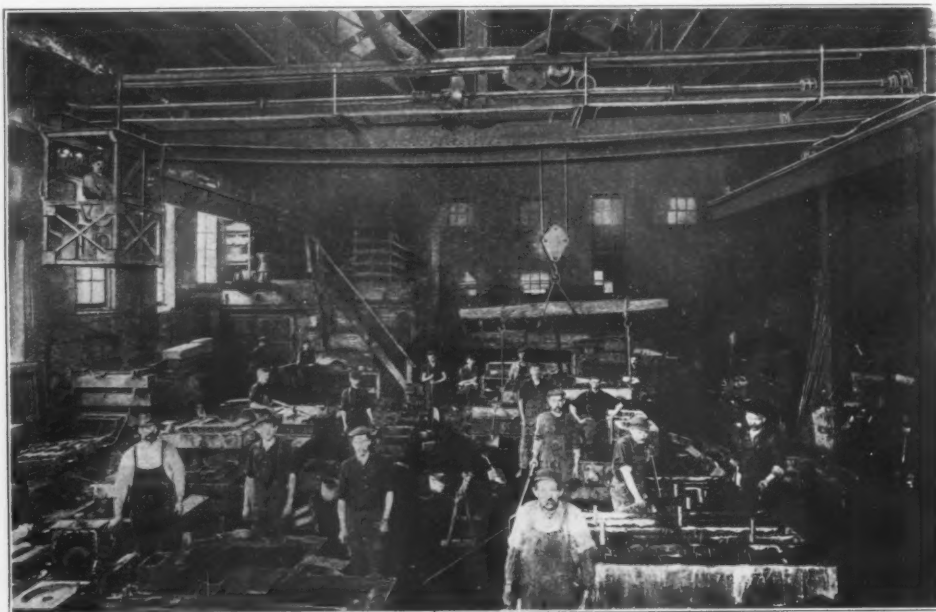


Fig. 6.—A Shepard Crane in the Gould & Eberhardt Foundry, Newark, N. J.



Fig. 7.—A Shepard Crane with Floor Control in the Erecting Shop of the Bickford Drill & Tool Company, Cincinnati, Ohio.

A powerful brake acts directly on the motor pinion, which in cranes equipped with an operator's cage, is applied by a spring and released by a foot pedal. The breaking effort is therefore of a definite but regulatable amount, regardless of the weight of the operator. Being normally applied when the crane is not in use the brake prevents drifting due to wind or other unintentional influences. The friction surfaces of the brakes are inclosed with the gears, and are protected and lubricated as in the other brakes. The materials, immersion in oil and other details in the design of the brakes on these cranes are an outcome of experiments which led to their selection as the only means to insure uniform holding power and small loss of adjustment from wear. Differences of

extend through the walls of the case, and oil on the rails would be a disadvantage. The case does, however, serve to exclude dirt and grit and protects the gears from injury from falling objects. The bridge end trucks are of structural steel, usually of box construction, as in Fig. 5, except where overhung wheels are necessary. The wheels are double flanged, with chilled and ground treads, and are keyed to their axles, which run in bronze bushed self-aligning bearings set in the truck framing. The bearings are self-oiling, and are removable bodily by withdrawing a single screw.

Electrical Features.

The motor controllers are exceptional only in the range they provide, particularly for the hoisting, where

there is a large number of intermediate steps. Precaution has been taken to provide durability and reliability in the electrical features, such as sizes of conductors, contacts, resistances, &c. In harmony with the general design of the crane the controllers have their working parts protected, these being of a nature peculiarly subject to injury from foreign materials.

All of the motors are of the interpole type, which is especially adapted to crane service, where high speeds are desirable for light loads and slow speeds for heavy loads. The interpoles allow for these conditions by neutralizing the distorting effect on the magnetic field of widely varying armature reaction and so insuring sparkless commutation. Co-operation on the part of the motor and crane builders has resulted in a design in which the motor becomes practically an integral part of the crane.

Lubrication.

Lubrication, concerning which much has already been said, has been such an important consideration in the development of Shepard cranes that it may be allowable to revert to the subject.

Oil is preferable to grease lubrication, because it is more efficient, will flow readily and is not appreciably affected by change of temperature. The designers feel some satisfaction therefore that they have succeeded in

the crane is used indoors. An outdoor use of a crane is illustrated in Fig. 8, this being a 10-ton motor driven transfer bridge in the steel yard of the York Bridge Company, York, Pa. On this bridge two 5-ton hoists are operated, and the operators' cages are attached to the trolleys instead of to the bridge on account of the long span, 115 ft. The bridge travel is controlled from only one of the operators' cages. A crane with floor control and no cage is shown in Fig. 7, a view in the erecting shop of the Bickford Drill & Tool Company, Cincinnati, Ohio. This crane has a capacity of 10 tons, a lift of 17 ft. and a span of 26 ft. 8 in. It is an example of a moderate size crane, of which the General Pneumatic Tool Company makes something of a specialty. It is the claim that cranes of small capacity are not improvised and adapted from other standard parts, but are exact duplicates on a smaller scale of those of large capacity, being identical in details of design, material and workmanship. If anything reliability is more essential in a small crane than in a larger one, since it is more apt to be subjected to overload, to be operated by unskilled labor and to be generally misused and abused.

The New Carnegie Institute.—The New Carnegie Institute at Pittsburgh, as now completed, represents an

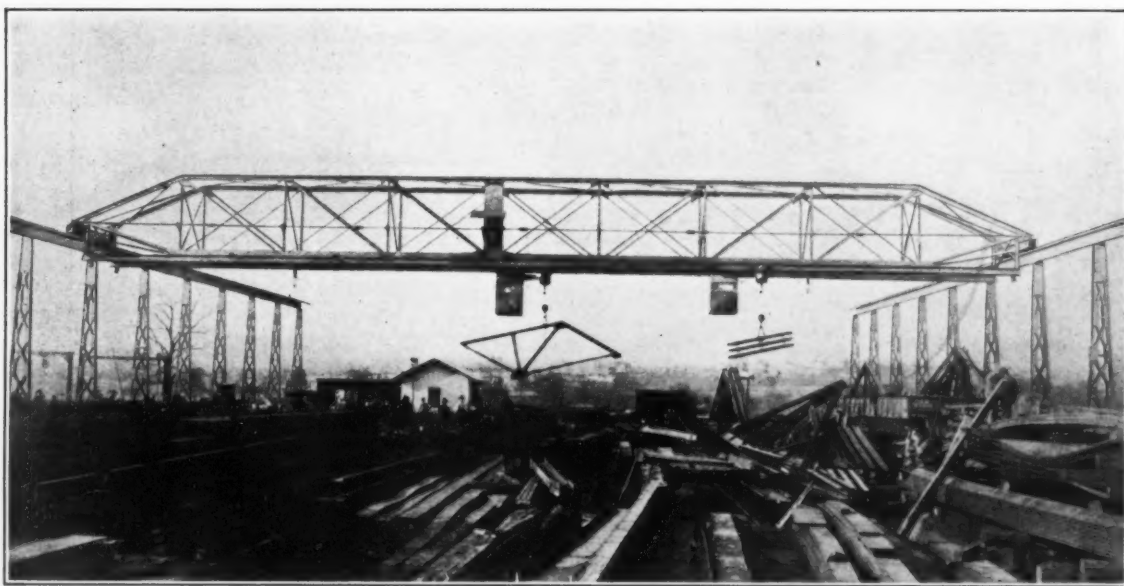


Fig. 8.—A Transfer Bridge with Two Shepard Inclosed Trolleys in the Steel Yard of the York Bridge Company, York, Pa.

making the use of oil practicable. The hoist gearing, mechanical brake, electric brake, cable drum bearings and hoisting motor bearings draw their supply from two large reservoirs, either by being partly submerged in oil or in communication with it by oil rings. As the inclosure is complete, including all shafts and bearings, it can be made perfectly tight against leakage, evaporation or contamination of the oil by grit or dust. Thus practically ideal conditions are realized. The trolley and bridge driving gears are oiled by one supply for each group, sufficient to partly submerge the gears. The trolley and truck axles, bridge shaft bearings, and such of the motor and shaft bearings as are not otherwise provided for, are oiled by rings dipping in oil reservoirs, which are guarded from dirt and have drain plugs for withdrawing old oil. An oil receptacle is also provided in the hubs of the lower block sheaves. Each oil reservoir is fed through a large cup, so located that when filled to the top the oil level in the inclosure will be right for efficient lubrication of the contained parts. Removing the cap of the cup exposes the oil level to examination.

Installations.

The other of the illustrations herewith are examples of typical installations of Shepard cranes. Fig. 6 is a view in the foundry of Gould & Eberhardt, at Newark, N. J., and shows a 10-ton crane having a span of 45 ft. It is in service of this character particularly that the inclosing of the working parts is important, even though

investment of \$11,000,000, and the building committee, of which W. N. Frew is chairman, has issued a report showing that a balance of \$3,376.56 remains unexpended of the \$5,000,000 appropriation last made by Andrew Carnegie. Of this appropriation, William Miller & Sons, Pittsburgh, received the greatest amount—\$2,768,471.56, for general work on the main building. Baker, Smith & Co. are next, with \$653,788.50 for heating and ventilating the same building. J. W. Alexander, the artist, received \$175,000 for the mural decorations of the entrance hall. J. Massey Rhind received \$140,000 for bronze sculpture. Among some of the others receiving large amounts were the following: F. F. Caldwell & Co., electric fixtures, \$83,788.30; James Wall Finn, decorative wall painting, \$87,032.40; Keystone Engineering Company, electric wiring, \$227,773.34; National Electric Company, generators, \$21,516.25; Otis Elevator Company, elevators, \$43,663.83; Providence Engineering Works, engines, \$56,924.14.

The Youngstown Sheet & Tube Company, Youngstown, Ohio, has placed a contract for two 1500-kw. Allis-Chalmers steam turbines. Julian Kennedy, of Pittsburgh, is consulting engineer. Both turbines are for 25-cycle, three-phase currents, 6600 volts, one to operate condensing and the other non-condensing, with steam pressure of 150 lb. per sq. in. The exhaust from the non-condensing turbine will be utilized for heating boiler feed water in an open type heater.

The Morse Rotary Wage Table.

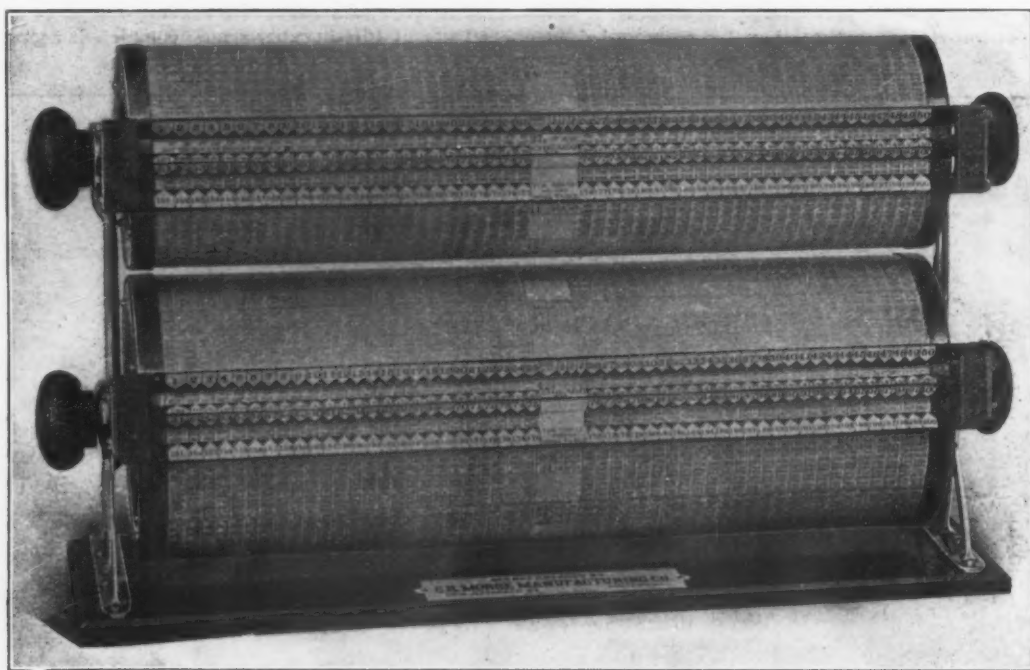
Increased attention is being given to devices and systems for facilitating clerical work in the offices of commercial and industrial plants. An instrument for rapidly and accurately performing calculations arising in such work is the Morse rotary wage table, an illustration of which is herewith given. This machine is made by the Charles R. Morse Mfg. Company, 56 Fifth avenue, Chicago, and although primarily adapted to figuring of pay roll extensions, can be readily modified to serve other purposes, such as computing distributions of costs and the figuring of piece work, invoices and percentages of gang earnings.

The machine consists of one or more light cylinders mounted on bearings and provided with knobs at either end for the purpose of turning them. These cylinders are covered with sheets of celluloid, upon which are printed the quotients resulting from the multiplication of the number of hours by the rate per hour. The adaptation of the principle of the slide rule is easily recognized in the operation of this device, but the products are here

ess is the same, except that the reading under the half hour on the bar is taken and added to the integral sum. It will thus be seen that when the machine is set at any given rate or multiplier the product for any whole number or a number with a fraction in quarters is obtained without further adjustment.

Tables can be arranged for various computations, such as the extension of lumber, cloth and other commercial invoices, in which the cost per foot, per yard or per pound would be the multiplier used, while the measurements or weights would constitute the multiplicands. These machines are very light and easily handled. The base is of hard wood, suitably finished, and has rubber feet at the corners to prevent scratching whatever it may rest on. The bars or eye pieces are made of aluminum and the stands and cylinder caps are brass, the former being nickel plated and the latter oxidized.

The Majestic Furnace & Foundry Company.—The Chappell Furnace Company, Morenci, Mich., manufacturer of Majestic warm air furnaces and coal chutes, has about concluded arrangements for the removal of its



A Rotary Table for Figuring Pay Rolls, &c., Made by the C. R. Morse Mfg. Company, Chicago.

given in plain figures, instead of scale divisions. The multiplicands, which represent the number of hours to be calculated at a given rate, are printed on horizontal bars, supported by movable arms, which may be raised or lowered to suit the line of vision. Extending around the body of the cylinder are the multipliers or rates arranged in numerical order and varied to suit the requirements of monthly, weekly or hourly wage scales, the two former advancing by 5-cent steps, the latter by $\frac{1}{2}$ -cent steps. Any special rate or multiplier required can also be inserted at small cost. Provision is also made for calculations of fractional parts of an hour, in five minute divisions. The tables can be furnished for hourly, daily, weekly, bi-weekly, monthly and semi-monthly pay rolls.

Because of its extreme simplicity no training or experience is necessary. To perform required calculations the cylinder is revolved until the desired rate appears between the inside lines of the bars, leaving the two lines of figures on the cylinder fully exposed; then the amount can be read directly above or below the number of hours designated on the eye piece, and pointing off two decimal places give the desired result in dollars and cents. For example, if it is desired to determine the wages earned in 87 hours at 25 cents per hour, the number 25 in the rate column is set between the bars and the amount opposite the number 87 on the bar, which is 2175, when pointed off two decimal places, for cents, gives the answer \$21.75. Where fractional parts of an hour are involved the proc-

plant from its present location to Huntington, Ind. Substantial inducements offered by the Huntington Factory Fund Association and the desire for increased space and shop facilities were the chief factors in making this change. The company will be reorganized under the name of the Majestic Furnace & Foundry Company, of which James M. Triggs, the founder and manager of the Chappell Furnace Company, will be manager. W. F. Triggs, who has for several years been connected with the Jones & Laughlin Steel Company, Pittsburgh, will act as superintendent. The plant buildings, work upon which will be begun immediately, will include a foundry 75 x 140 ft.; machine shop, 40 x 132 ft., and warehouse, 40 x 100 ft., all of which it is hoped to have completed and ready for occupancy about January 1. Besides the manufacture of its regular line of furnaces and coal chutes the company will do a general gray iron casting business, as well as jobbing machine shop work.

The Kent Machine Company, Kent, Ohio, has been incorporated with a capitalization of \$50,000 by F. H. Merrill, M. G. Garrison, H. H. Line, J. G. Getz and W. S. Kent. The company will manufacture concrete mixers, cement block machines and gasoline engines. The new company has an option on the plant of the Kent Mfg. Company, and expects to occupy that plant when the latter company moves to Franklin, Pa.

The Economy Electric Tiering Machine.

Economy of space in warehouses and storerooms requires piling of heavy packages in tiers, and for this work portable elevators or tiering machines have special advantages. A hand power portable elevator of this type made by the Economy Engineering Company, Chicago, has by its successful use led to a demand for a power machine of like character; and to meet this demand the company is introducing what it terms an electric tiering machine, illustrations of which are shown herewith.

The machine is essentially a portable electric elevator. It is of steel construction throughout, and is supported on a base frame which when stationary rests on two short legs and the two front wheels. By means of a third wheel at the rear set in a swiveled bell crank axle, to which is attached a guiding tongue, the legs are lifted clear of the floor and the machine made portable. For convenience in passing through doors or openings the

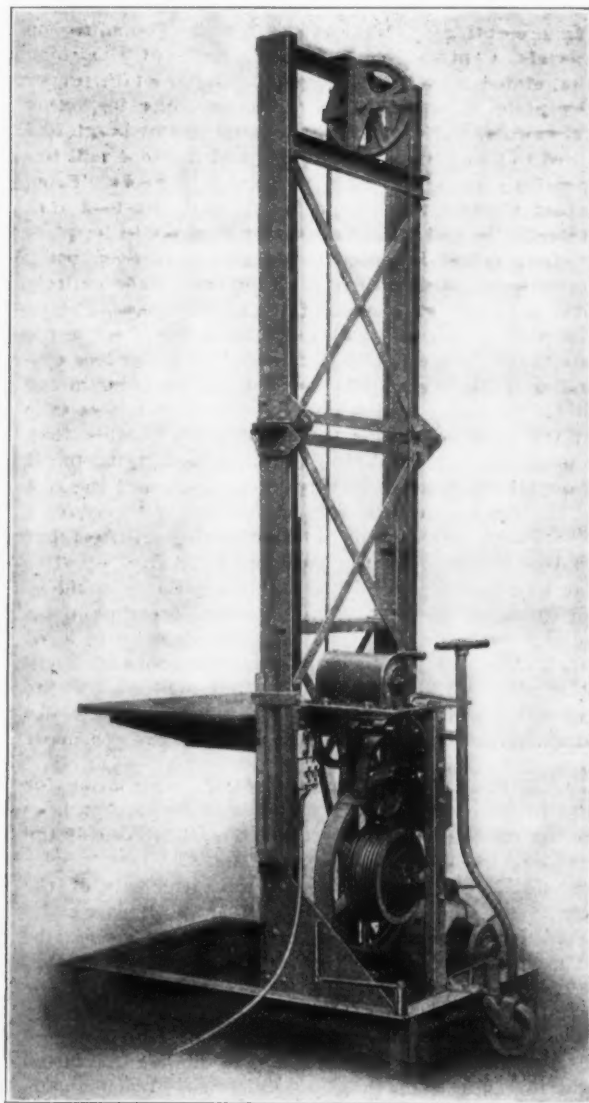


Fig. 1.—The Electric Tiering Machine Made by the Economy Engineering Company, Chicago, Ill.

uprights of the main frame are hinged about midway of their height, and may be folded back in compact form.

The motor, which is of the four-pole compound elevator type and of 2-hp. capacity, is connected by a chain belt to an upper pinion shaft through which the cable drum is driven by a train of gears. An automatic stop of standard elevator design limits the platform travel in either direction, and is mounted on the drum shaft and connected by sprocket chain with the controller.

The latter is of special design, a single handle serving to control the up or down movement of the platform. An external expanding brake is fitted to the upper pinion shaft to hold the load at any point when the motor is idle. The brake is set by a spring, and is released by the

action of a solenoid. Connection to the power circuit is effected by means of a steel armored conduit, 50 ft. long, which is provided with a plug for attaching to convenient current outlets.

In the standard machine, herewith illustrated, the lift platform is 30 x 37 in., and the machine itself has a height over all of 10 ft., and occupies a floor space of 38 x 57 in. Its guaranteed capacity is 1000 lb. when lifting at

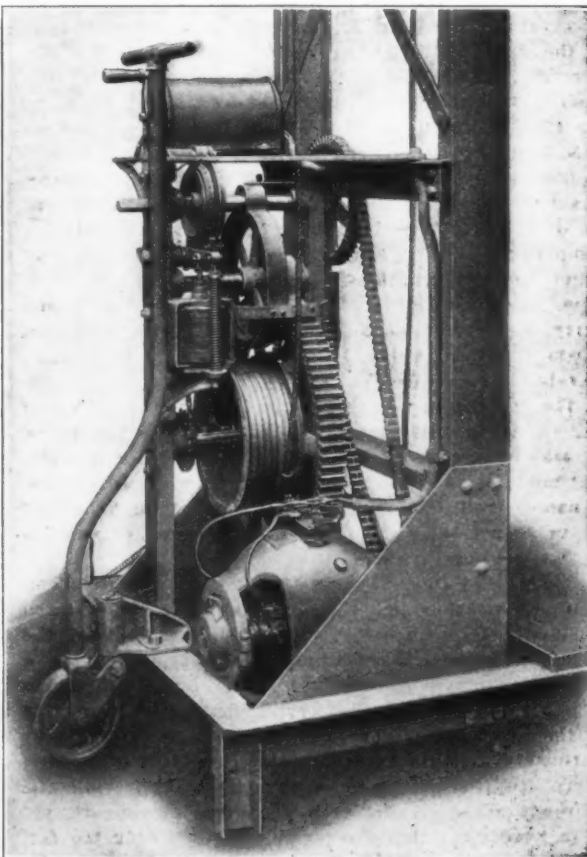


Fig. 2.—A Nearer View of the Hoisting Mechanism from the Opposite Side.

the rate of 40 ft. per minute. Other sizes, however, are built to suit special requirements.

Electric Steel Making in Germany.

A new plant for the production of steel in a modified Kjellin induction furnace was recently inspected by representatives of German, Belgian and Russian steel manufacturers at the works of the Röchling Iron & Steel Works, Völklingen, Germany. The furnace has a charge of three tons and had been in operation for several weeks. It purifies a liquid charge from the basic converter down to mere traces of sulphur and phosphorus. The furnace is founded upon a combination of the original Kjellin furnace, with various improvements which have been carried out by Messrs. Röchling and Rodenhauser.

It is stated that a company has been formed in Berlin, known as the Gesellschaft für Electrostahl-Anlagen, which will utilize the Kjellin and Röchling-Rodenhauser type of furnace for the production of iron and steel and ferro products. The Siemens-Halske Company and the Röchling Iron & Steel Works are prominent in the new company. Its operations will extend to all countries except Great Britain and its colonies, the United States, Norway and Sweden, in all of which companies already exist for the exploitation of these furnaces.

For some years it has been the custom of the Westinghouse Air Brake Company, Wilmerding, Pa., to distribute turkeys to all its employees the day before Thanksgiving. At a recent meeting of the Board of Directors, it was decided to abandon this custom, but to do something better in the establishment of a pension fund for old and disabled employees. A committee was appointed to formulate a plan for carrying out the project.

The American Boiler Manufacturers' Association.

NINETEENTH ANNUAL CONVENTION.

The nineteenth annual convention of the American Boiler Manufacturers' Association was held at the Piedmont Hotel, Atlanta, Ga., on October 8, 9, and 10. The local committee of arrangements was as follows: Frank Harrison, chairman, formerly local representative of the Jones & Laughlin Steel Company; E. M. Cole, secretary, R. D. Cole Mfg. Company; V. A. Moore, iron broker; N. H. L. Nelms, division freight agent, Seaboard Air Line Railroad; J. M. Van Harlingen, iron broker; C. N. Dannals, local representative of the Jones & Laughlin Steel Company; M. F. Cole, R. D. Cole Mfg. Company, president American Boiler Manufacturers' Association; W. M. Francis, general inspector, Hartford Steam Boiler Company; F. A. Dilworth, Carnegie Steel Company; Adam Jones, International Steam Pump Company; C. P. King, American Iron & Steel Mfg. Company; S. J. McGarry, J. J. Finnigan & Co.; Horace Parker, American Steam Gauge & Valve Mfg. Company; R. P. Decker, Cleveland Pneumatic Tool Company.

The convention was one of the largest ever held, and was called to order by Frank Harrison. After a few remarks he introduced Governor Hoke Smith, of Georgia, who made a most felicitous address of welcome. Councilman Terrell was next introduced, and on behalf of Mayor Joyner, who was unable to be present, extended a cordial welcome to the visitors.

W. H. S. Bateman, secretary of the associate members' organization and a representative of the Chicago Pneumatic Tool Company, responded on behalf of the American Boiler Manufacturers' Association, paying a high encomium to the South in general and Atlanta in particular. He referred to certain legislation prevalent in the South of recent years adverse to railroads as detrimental to ultimate business progress and prosperity. There are always two sides to a story, and while the railroads are deserving of a good deal of censure, yet there were signs that the pendulum has swung too far, and it is hoped that this fact will soon be realized. No one who has not traveled through the South, the speaker said, can fully appreciate its surprising development in recent years. Referring to the boiler manufacturing industry, he said this is not what it was 20 years ago. It requires brains, science and skill to construct a boiler to meet the requirements not only of the United States Government but those conditions attendant upon the developments of the present date, and especially is this true as applying to railroading. A greatly increased tonnage is now carried with correspondingly greater demand upon motive power.

At the conclusion of Mr. Bateman's address, Secretary J. D. Farasey, in behalf of D. J. Champion, of the Champion Rivet Company, Cleveland, Ohio, presented President Cole with a handsome gold mounted gavel, which was a replica of the Champion rivet, upon which was engraved an appropriate inscription.

President M. F. Cole then addressed the convention in part as follows: "I am proud of the honor of being the president of this body, a convention of men who do not claim to be much on speeches, but sublime when it comes to making noise. Our organization is one of the best and should be one of the largest in the country. The basic aims are correct in principle and most worthy as to ends sought: First, that we may meet on a common plane as friends, and not as cut throat competitors, and second, that we may manufacture boilers that are safe at lowest prices. In the former we have been absolutely successful, and in the latter we are encouraged all the while by progress, and to-day members of the association are producing a type of boiler that has been on the market for more than a dozen years and, so far as we have record, only one explosion has occurred, and that is accounted for by gross ignorance and criminal negligence. Few people realize what has been accomplished, outside the bone and sinew of the business. Within my own memory the changes are marked. The machine riveter

and flanging machine have greatly simplified regular work, and with a lessening of the trials the morals of workmen have improved in ours as well as in all other lines of business."

TUESDAY AFTERNOON.

At the Tuesday afternoon session President Cole appointed these committees: Auditing Committee: J. Don Smith, Geo. N. Riley, S. A. Fortson. Committee on Place of Next Meeting: W. A. Brunner, R. H. Bate, J. D. Farasey. Committee on Resolutions: T. M. Rees, M. A. Ryan, J. J. Finnigan. Nominating Committee: H. J. Hartley, Geo. N. Riley, E. J. McDuffie

The Quality of Boiler Plate.

In presenting a verbal report for the Committee on Materials, Captain Rees, in the absence of Chairman Meier, stated that it was very difficult to obtain proper boiler plate to pass the United States boiler inspection requirements, and that all of the mills in Pittsburgh had refused to make this steel but one, and that one mill has successfully made it within the last few weeks. From all that Captain Rees could learn, he understood that the steel mills had been endeavoring to make boiler plate too cheaply and in order to do this have been using inferior scrap. One mill in a recent heat, made entirely by the acid process instead of the basic process, and by using entirely new material, did not lose one sheet in the heats that it made, and has filled all of the orders outstanding on its books. The speaker had an order in one mill for over six months and believed that it was true that the mills are trying to furnish plate cheaper than the users of the plate desire, and have been trying to get out quantity instead of quality. He emphasized the fact that those who use boilers in his section of the country do not want a cheap or inferior quality of steel but would be willing to pay a good price for steel equal to what was formerly furnished the trade if they could be allowed under the marine laws a steam pressure in accordance with the quality used. The speaker believed that if the mills that are not too badly rushed will put good material in the heats they will be able to produce a boiler plate entirely satisfactory to the boiler manufacturers, and such as has not been had for many years.

M. A. Ryan did not believe that the association for years to come could obtain a thorough revision of laws covering marine boiler inspection. Practically all of the work done by him is marine work and he experiences a great deal of trouble to meet the requirements of the present laws. The mills absolutely refuse to roll plate under the old specifications, and he has orders in for six months and no sign of plate yet. He was surprised to learn that any manufacturer would try to get an inferior grade of plate for the manufacture of marine or any other boilers and as inferior steel will jeopardize life and property, the speaker did not believe that the manufacturers ought to supply such inferior steel even if a demand is made for it. Mr. Ryan commented unfavorably on the lack of qualifications on the part of some boiler inspectors, who were endeavoring to perform a duty which they were incapable of performing properly by reason of their ignorance of the subject. The local inspectors in his district were honest men, and their chief was a very practical man who had served his time in a machine shop, was an old engineer, and a man who would listen to reason; but it was simply an impossibility to manufacture boilers and comply with the existing marine boiler inspection laws which are full of manifest contradictions and absurdities. If a boiler could be made under such requirements, it would not then pass inspection under the Hartford rules. He could not understand why regulations that are so absurd and detrimental should be permitted to remain in force. He did not understand why the mills could not furnish the quality of

material demanded by boiler manufacturers if the boiler manufacturers are willing to pay for it.

Defense of the Steel Manufacturers.

President Cole invited W. L. Hirsch of the American Steel & Wire Company to address the convention in this connection.

Mr. Hirsch said that he had been a seller of boiler plate for 25 years, located quite close to the mills, and possessing some knowledge of chemistry and the physical properties of steel. For 20 years his concern had made contracts with the leading railroads of the United States for fire box and boiler steel, subject to the most rigid chemical and physical requirements in specifications of any steel produced, not excepting that for the United States Government. He continued:

In earlier days, crucible steel was the only steel in existence. While crucible steel is of superior quality, the peculiarity of this steel is such that by reason of having to produce the metal in small pots, it is impossible to make large plates such as are demanded to-day, and in order to reduce the number of seams that are necessary for steam boat and locomotive boilers. We have developed beyond that process, and in this development have gotten quantity at the expense of quality. It is now necessary to use the process that will produce plates of sufficient size to meet the present demands of boiler manufacturers and users. This is found in the acid open hearth process. The speaker denied the truth of the statements made that steel manufacturers are employing an inferior quality. Scrap of a certain quality is used alike in both the basic and acid process. It is a fallacy to maintain that in the basic open hearth process worn out or burnt up stuff, castings, tin cans, or "anything that a goat cannot eat," is used. To determine the quality of boiler plate it must be measured by chemical and physical requirements.

Under the Bessemer process are made rails, bars, and all common steel products. Sometimes under the Bessemer process a steel will be produced having the chemical and physical qualities of boiler plate. However, no reputable concern would ever use Bessemer steel for boiler plate because it would not give the proper results and it would be dangerous to human life to employ it. The steel maker is not infallible, the speaker said, but endeavors to comply with the best specifications and to obtain the required chemical and physical results as long as they are within reasonable bounds. The American Steel & Wire Company has always sought for quality instead of quantity. A year ago last July the United States Government asked this company to comply with certain specifications for marine steel, which the company declined to do because the specifications were impracticable—not because the company could not produce high quality steel; on the contrary, it has produced fire box and boiler steel of high class quality.

The impracticable specifications referred to were possibly got up by men who did not understand the physical and chemical qualities of steel, and who required combined physical and chemical conditions which could not be practicably produced. An association representing all of the plate makers of the United States has frequently discussed all these conditions, and the speaker wrote to every plate maker in the United States requesting his views as to the new specifications of the Government. A majority of those addressed replied that they would decline to consider orders under such specifications. This company is anxious to supply not only the boiler makers but the United States Government with the product they require, but it cannot perform impossibilities. In this progressive age, when quantity is an urgent necessity, and when the prices have been forced down from \$5 to \$1.70 per 100 lb. the same quality cannot be expected. The demand for common steel products is so extensive and insistent that we are compelled to give first attention to meeting this demand. Talk is one thing, but performance is another, and the specifications of the United States Government as they exist to-day are too drastic and impracticable. Surely a concern that has prided itself on quality for 25 years would not say that it cannot produce the material unless the specifications are impracticable. The speaker contended that boiler plate that contains not to exceed 0.04 phosphorus and not to exceed 0.04 sulphur, with the tensile strength regulated entirely by carbon, is a good steel; and when steel is produced that under test meets all of the specifications and was better than anything that was ever produced before, but is rejected because it shows a difference of not exceeding 1 per cent. between coupons cut longitudinally and those cut transversely, such rejection is unreasonable. Steel can be produced of a good quality but we absolutely refuse to produce to fancy specifications, got up by impracticable men. Steel showing 25 per cent. elongation, a stretch of $\frac{1}{4}$ -in. in one inch or 2 in. in 8 in., is certainly a good steel. Another man may demand 26 per cent., another 27 per cent., and so on up to 30 per cent., at which point the steel manufacturers must stop.

The speaker said that he was absolutely familiar with

the process of steel making, from the crucible to the basic, and also with the chemical and physical specifications necessary to produce boiler plate, fire box and marine steel, and was confident that the manufacturers could not produce marine steel at 2 or 3 cents per pound and come out whole. Boiler manufacturers are right in enjoining upon the manufacturer that his steel must contain not more than a certain amount of phosphorus, a certain amount of sulphur, and a certain amount of silicon; but the hardness and softness of steel are regulated entirely by the carbon. Tensile strength is not a question of quality but of the hardness or softness.

A tensile strength of 55,000 or 60,000 lb. with high elongation and ductility is better than 65,000 to 70,000 lb. tensile strength with less ductility and low elongation. When in use steel crystallizes and hardens, and the speaker would prefer to risk his life and the lives of others who have to do with boilers or come about them with steel of the former rather than the latter kind. He therefore asked the boiler makers to kindly bear with the manufacturer and to consider his conditions, and not to insist upon an absolute demand that was not practicable, but rather to consult with the manufacturers and endeavor to meet the mutual requirements.

The Position of the Boiler Manufacturers.

Replying to the speaker, Captain Rees said that he agreed with him that if the boiler manufacturer desired good steel he should pay for it. He had never experienced any trouble with crucible steel for fire box and locomotive boiler use, and for the best article was willing to pay the best price, but steel plate made by the crucible process is now prohibited by the United States law. The speaker had protested against this prohibition, and is so on record. The speaker had submitted the physical proof before the department at Washington upon an occasion when a meeting of steamboat men and boiler manufacturers was called at Washington city. He took a test from a plate made in 1879 and placed it in comparison with a test from a plate made for a steamboat owned by the American Steel & Wire Company, and this comparison was submitted to Secretary Metcalfe at that time proving that the plate made in 1879 was still good, although the other had deteriorated from the heat to which it had been subjected by use in the boiler, so that it was utterly worthless. The speaker said that neither the users nor boiler manufacturers have approved the changes made in the marine law, which had been brought about by the plate manufacturers in conjunction with the supervising inspectors, who made some changes in the test pieces without changing the rules to correspond therewith. For five years efforts have been made to secure a change in the rules to correspond with the change in the test pieces, so as to allow the same steam pressure as formerly allowed.

The speaker recently met a boiler inspector who showed him a test piece from a plate that he had tested and had flattened it out at once with one blow of the hammer, and which on its face showed that it was a fine piece of steel and fully met the requirements. The inspector added that every piece pulled in that heat had passed satisfactorily the test required, and that this steel was fully equal to the boiler plate made in years past. The speaker said that he was fully satisfied that the steel from which this test piece was taken indicated that there would be no more trouble hereafter in getting the plate that boiler manufacturers desired. He had since learned that this plate of steel was a heat that the steel maker had received instructions to make by the acid process, using the very best materials, and was informed that all that was needed was good material in order to make it properly by the acid process so as to fully meet all requirements. The speaker understood that it was not a question so much of cost with the manufacturers as it is the matter of detention and delays in getting material promptly.

Mr. Hirsch said that he would like the association to consider the matter of increasing the thickness of boiler plate and reducing the tensile strength, in order to give the same power pressure, because it is easier to work a softer material of a thicker gauge than to work a harder plate of a thinner gauge. It seemed to the speaker that it would be better for the boiler manufacturer to employ a thicker plate and of a softer and more ductile material rather than harder plate of a thinner

gauge that might give out more easily. The thinner a plate is made in the process of manufacture the harder it becomes. A plate $\frac{3}{4}$ in. thick that will show 25 per cent. elongation in 8 in. will show 20 per cent. in a $\frac{1}{4}$ in. thickness.

An invitation was received from the N. P. Pratt Laboratory to visit its modern and well equipped plant, after which an adjournment was taken until Wednesday morning, when reports of committees were heard.

WEDNESDAY MORNING.

The Committee on Place of Next Meeting reported in favor of Atlantic City, stating that a canvass of the members present had shown an almost unanimous sentiment in favor of this selection. After a full discussion, Atlantic City was selected as the place of meeting for the twentieth anniversary. The discussion of this matter developed the feeling that there had been too much entertainment at past conventions, often on a very lavish scale, which was not objectionable, except for the fact that it gave to absent members an impression that nothing else but social pleasure occupied the attention of the members in convention. It was, therefore, thought best to cut out all entertainment other than of an individual character at the next convention, with the exception of the banquet, which would take place after all business had been attended to.

The report of the Auditing Committee, which was accepted, showed that the accounts of the secretary and treasurer were in proper shape.

The Nominating Committee reported as follows: For president, M. F. Cole, Newnan, Ga.; first vice-president, T. M. Rees, Pittsburgh, Pa.; second vice-president, J. Don Smith, Charleston, S. C.; third vice-president, W. A. Brunner, Phillipsburg, Pa.; fourth vice-president, H. D. MacKinnon, Bay City, Mich.; fifth vice-president, M. A. Ryan, Duluth, Mich.; secretary, J. D. Farasey, Cleveland, Ohio; treasurer, J. F. Wangler, St. Louis, Mo.

On motion of Colonel Meier, the above were unanimously elected. The re-election of M. F. Cole as president was a deserved indorsement of his administration.

Secretary Farasey said that many boiler manufacturers outside of the association were entirely ignorant of what had been accomplished by it. One such manufacturer had lately complained to him that nothing had been done in regard to marine boiler inspection laws, and in reply he had referred the gentleman to some 30 pages in last year's proceedings that show what the association had attempted to do in this direction, and while the greater amount of time, labor and money spent had not yet brought all of the results desired, yet the repeated agitation of the matter has undoubtedly accomplished much good.

The Revision of Marine Laws.

Colonel Meier, who was not present on the opening day of the convention, was asked to speak upon the subject of materials and also revision of marine laws. Referring to the latter, he said that the boiler inspection service being now a department of the Bureau of Commerce and Labor, the proposed revision would have to come before Congress with the approval of that department, and it is now so busy with matters having to do with corporations generally that it is a bad time to agitate the matter further, but he had been assured by Herbert Knox Smith, Commissioner of Corporations, that while it would be impracticable to secure a wholesale revision of boiler inspection laws at this time, yet the department would cordially co-operate with the boiler manufacturers in any effort to amend or revise special sections of the law in order to meet modern commercial conditions.

At the time Secretary Shaw was at the head of the Treasury Department, the Boiler Inspection Department being then under his supervision, the A. B. M. A. Committee on Uniform Boiler Specifications secured his hearty indorsement of needed reforms it had proposed, and had at that time every prospect of success, except for the opposition of some very powerful interests which at that time the speaker did not understand the source of, but had since learned came from lake steamboat men who were opposed to a general revision, because they

knew what they already had and were afraid that in getting something new they might get into worse trouble. At that time also the House Committee was very favorable to the requests of the boiler manufacturers and received them very kindly, asking very intelligent questions, but still when the matter got into the House it failed on account of the opposition above referred to. Still, the speaker thought that by continuing to thrash matters out with the Supervising Boiler Inspectors a good deal could be accomplished to relieve the odium of the present laws, and particularly to secure recognition of the different seam values.

At present the law recognizes only the double riveted lap, but one of the supervising inspectors has worked up some elaborate tables which he intends to propose, and which this association will then be called on to criticize. That is the only way to get things done, to go after them vigorously, energetically and persistently, one thing at a time and to complete the thing begun, although it may be very hard work. A general repeal of the law is impossible, and it would certainly be a waste of time and money to try to get it at this time, for the reasons stated.

In regard to the matter of materials the speaker thought that the department had accomplished a great deal considering the condition of the trade some years ago. The A. B. M. A. specifications are used and approved, not only generally throughout this country, but requests are continually coming in from all over the civilized world. The steel manufacturers objected to certain stringent specifications, and they went before the Board of Supervising Inspectors without the knowledge of this association and secured the adoption of their own specifications with some modifications. Later, a conference was had with them by a committee from this association in New York to endeavor to get together, and the only essential point of difference was the matter of sulphur. The speaker said that he was able to obtain steel with less sulphur in it by paying a better price, which he was willing to do; but the steel manufacturers said that they must have a little more latitude in regard to sulphur in supplying the general trade; however, the speaker thought there is no real antagonism between the two associations, and thought they could work together before the Board of Supervising Inspectors. It is more difficult to get good steel now than a few years ago, owing to the tremendous wave of prosperity and the great demand upon the steel mills to turn out product which does not always result in the best quality unless the buyer stands up for his rights and demands it.

The associate members and supply men, who had been conferred with touching the proposed cutting out of general entertainment features at the next annual convention, now reported through J. T. Corbett that the action taken by the parent organization was entirely satisfactory to the associate members, who would be always pleased to co-operate in any manner that they are requested to do to further the success of the conventions.

A letter of regret was read from Supervisory Inspector General George Uhler, whose presence at the last convention was so highly appreciated.

Colonel E. D. Meier, G. N. Riley and H. J. Hartley were appointed a committee to send a telegram of condolence to James Lappan, of Pittsburgh, prevented from attending by his wife's illness.

A special committee appointed to prepare resolutions in memory of the father of the president, Mathew Cole, who died February 19, submitted its report, which was adopted unanimously.

John J. Finnigan, of John J. Finnigan & Co., Atlanta, Ga., was elected to active membership, and was introduced by President Cole to the members.

THURSDAY MORNING.

The greater part of Thursday morning was taken up with an executive session, from which the convention arose for a sufficient length of time to receive the members of the Supply Men's Association who filed in with great dignity and paid their respects, and promised their hearty co-operation to make the twentieth annual convention at Atlantic City the best ever.

It is learned that during the executive session atten-

tion was given to the labor situation and the necessity for united effort in a practical way. No enmity was expressed to labor organizations as such, but a decided stand was urged against the unjust encroachments of labor agitators and others on the rights of manufacturers. Another matter that was quite freely discussed was the proper attitude which private inspectors and consulting engineers should occupy in their relation to contractors. It frequently happens that such inspectors or engineers take practically the position of an attorney for the purchaser, when they should rather stand impartially between the two parties and content themselves with seeing that the work contracted for is fairly done, and not attempt to get more out of a manufacturer than he has agreed to do.

At the Thursday afternoon session, before again taking up the executive session, the convention adopted by unanimous vote resolutions of thanks to those who had made the visit to Atlanta so enjoyable.

Topical Questions Discussed.

The discussion of topical questions submitted by J. Don Smith, second vice-president, Charleston, S. C., was next taken up; the first question being, "Is the Sudden Stopping of High Pressure Marine Engines Detrimental to the Boiler?" This brought out many interesting experiences.

The next question was, "Is the Ordinary Boiler Inspector of the Insurance Companies and the Government a Hindrance or An Aid to the Boiler Manufacturer?"

The third question was, "Can Any of the Members Give from Experience of Practical Testing the Best Spacing of Tubes in High Pressure Boilers?"

Entertainments.

The associate members and supply men held several well attended business sessions during the dates of the meeting, and adopted a constitution and by-laws for their future government. They re-elected the following officers: President, W. O. Duntley, Chicago Pneumatic Tool Company, Chicago; secretary, W. H. S. Bateman, Chicago Pneumatic Tool Company, Philadelphia; vice-president, J. T. Corbett, J. T. Ryerson & Son, Chicago; treasurer, H. B. Hare, Otis Steel Company, Cleveland, Ohio. The Executive Committee for the coming year will be appointed by the president later. Definite rules regarding future entertainment features generally were adopted; local committees to be abandoned so far as taking care of entertainment, and this work will be looked after by members of the Executive Committee of the supply men's organization as designated by its president.

The entertainment features of the convention covered many special attentions to the ladies, such as trolley parties, theater party for all members, tours through shopping districts, trip to Marietta, &c. The barbecue Wednesday afternoon at Ponce de Leon Club grounds was tendered to the convention by the R. D. Cole Mfg. Company, and was to the Northern visitors especially a very unique form of entertainment. It was followed by dancing and other recreations at the pavilion. The same evening a delightful informal reception was held at the Piedmont. On Thursday evening occurred the annual banquet, which was conducted with the excellent taste that characterizes all of these yearly functions of this association. Souvenirs from the associate members were imitation cotton bales. The punch was served in pasteboard tubular boilers. Col. E. D. Meier of the Heine Safety Boiler Company, New York City, acted as toastmaster. After dinner speakers were the following: "The Southern Manufacturer," Samuel D. Jones, president Atlanta Stove Works; "Air—for Various Purposes," Thos. Aldcorn, Eastern sales agent Chicago Pneumatic Tool Company, New York; "The Elastic Limit," D. A. Tompkins, Charlotte, N. C.; "The Ladies," Frank Harrison, chairman Local Committee of Arrangements, Atlanta, Ga.; "Boilers, Past and Present," M. A. Ryan, Duluth. The last named was a substitute for John J. Main, the Toronto member, and incidentally invited the association to meet in Dublin in 1909. Contributors to the entertainment fund were as follows: American Steam Gauge & Valve Company, American Iron & Steel Mfg.

Company, American Vanadium Company, Ashton Valve Company, Bourne-Fuller Company, Champion Rivet Company, Carnegie Steel Company, Chicago Pneumatic Tool Company, R. D. Cole Mfg. Company, A. M. Castle & Co., Phillip Carey Mfg. Company, Cleveland Pneumatic Tool Company, Firth-Stirling Steel Company, John J. Finnigan & Co., Glasgow Iron Company, Globe Rolling Mill Company, Hartford Steam Boiler Insurance & Inspection Company, Hanna Engineering Company, R. C. Hoffman & Co., Ingersoll-Rand Company, Independent Pneumatic Tool Company, Jenkins Bros., Jones & Laughlin Steel Company, Jameson, McKenzie & Evans, Keasby & Mattison, Lunkenheimer Company, La Belle Iron Works, J. E. Lonergan & Co., Lukens Iron & Steel Company, Lombard Iron Works & Supply Company, Monongahela Tube Company, Marion Iron Works, National Tube Company, Otis Steel Company, Ltd., Penberthy Injector Company, Phoenix Iron Company, Reading Iron Company, J. T. Ryerson & Son, Scully Steel & Iron Company, Shelby Steel Tube Company, Standard Tool Company, Spang, Chalfant & Co., Tyler Tube & Pipe Company, Upson Nut Company, Valk & Murdoch, Worth Bros. Company.

The Dominion Iron & Steel Company's Outlook.

TORONTO, October 12, 1907.—In his address at the annual meeting of the Dominion Iron & Steel Company, held in Montreal, October 9, President Plummer made the following remarks on earnings, prices and outlook:

I wish to say this, that you must not expect, and it would not be fair to expect of us to show this rate of progress always. We started with \$71,000 surplus in 1905, increasing to \$652,000 in 1906 and \$1,498,000 in 1907. There will come a time when we cannot show such progress as that, as you must realize, but in the year so far gone we have held our own. We are showing figures which, if we hold on through the year, will show, instead of \$1,498,000 surplus earnings, something like \$2,000,000.

While we are on this point, I may refer to the condition of our business. You know that there is a certain flattening in the iron and steel business to the south of us. In the United States they are beginning to wonder whether they have reached the point at which they must turn and go down hill. I could not find when down there recently that there was any very great fear of the iron and steel situation, but nevertheless I think we may look for a distinct lessening of the consumption of iron and steel, and consequent flattening of prices. Our belief is that it is not going to affect us very seriously. We have business enough on our books, with the business that must necessarily come to us, to absorb all our output to the end of next season, away on to the fall, I think I am safe in saying—over a year from now.

On the subject of bounties, cost of production and permanency of the ore supply he had this to say:

With regard to the bounties, which you see from the report were extended, I only wish to make this remark, that since the plant began its operation as a finished plant, which it may be said was in 1905, we have found that our steadily decreasing costs have just about offset the decrease in the bounties.

There was one point in the report that I should also like to draw attention to, and that is the question of our property at Wabana. We have two seams under the sea, and we have prospecting tunnels out on both of those seams, and all the evidence we have obtained so far by all our operations, both on land and sea areas, confirms the belief that these ore seams are permanent and continuous. They improve in quality as they go down, and we feel fully justified in the statements which we made, that in our opinion these mines will furnish us with practically an inexhaustible supply of ore at a moderate cost.

C. A. C. J.

Reports that the Bessemer & Lake Erie Railroad, operated by the Carnegie Steel Company, would build large car shops at Greenville, Pa., are untrue. Some additions to the shops at Greenville are being made to take care of repairs and some new equipment is being added. Plans have been approved by the Bessemer & Lake Erie Railroad for the use of steel ties on that road next year. More than 70,000 of these ties will be used for renewals and repairs at points where wooden ties are now in use, and about the same number will be used for new construction. This road will have at the end of this year more than 90 miles of track laid with steel ties. This is interesting in view of the fact that a number of the larger railroads have again taken up steel tie tests.

The Production of Tin in 1906.

WASHINGTON, D. C., October 15, 1907.—Metallic and stream tin were produced in the United States in 1906 in four widely separated localities to the aggregate value of \$35,600, according to the annual report of the United States Geological Survey prepared by Frank L. Hess. Owing to the importance of tin from an industrial standpoint the Survey has been at great pains to cover the subject comprehensively and carefully. Complete statistics are presented showing the production and consumption of the countries of the world and the development work that has recently been accomplished.

Domestic Production.

In the year 1906 the only actual output of metallic tin in the United States was 2500 lb., produced from 3750 lb. of concentrates at the Gertie Mine, in the Black Hills of South Dakota. This mine is now 500 ft. deep. Buck Creek, Alaska, produced 45 net tons of stream tin, and the Bartels Tin Mining Company, at Cape Prince of Wales, produced about 10 net tons of concentrates, carrying 64 per cent. of metallic tin, which were shipped to England. About 14 net tons of concentrates were produced in the North Carolina-South Carolina tin field. The estimated value of the total output, including metallic tin and concentrated ores, was \$35,600.

Prospecting was actively carried on in Alaska along the streams flowing to the Arctic Ocean from the hills surrounding Buck Creek and on the streams farther to the east. Much prospecting was also done on the lodes discovered on Potao Mountain and the adjoining hills, at the head of Buck Creek; and on Cape Mountain several hundred feet of tunnel were driven, and a good deal of drilling was done in the granite with a chilled steel-shot core-drill. Prospecting along creeks between the head of Buck Creek and Cape Mountain is said to have shown the presence of workable values in many of the gravels. Two parties sluiced the tin-bearing gravels of Buck Creek, and it is reported that 400 lb. of cassiterite per cu. yd. was found in small areas. The gold content of the gravels, formerly considered as about 40 cents per cu. yd., is said to have been found to be higher since the bed rock is well stripped.

One lot of 30 tons of stream tin averaged 64.3 per cent. metallic tin. It was sold in Hamburg, Germany, and brought a good price on account of its purity. Prospecting was also carried on in the Ears Mountain region, and encouraging results are said to have been obtained, though there has been no production of tin from this place. Prospecting was continued on the Lost River deposits, and is said to have shown the bodies of tin ore to be of good size.

Articles have appeared in several periodicals stating that large dredges were to be placed in some of the creeks flowing into Lopps Lagoon, or the Arctic Ocean, to mine stream tin. This is an undertaking which will require very careful preliminary prospecting, and it is more than likely that the gravels will be found to be frozen in much of the region, in which case a dredge would be unable to work. There is some talk of erecting a tin smelter in Seattle to smelt Alaskan ores but this proposition has not yet taken definite form.

In the Black Hills interest in tin mining has been greatly revived by the high price of the metal and a number of tin deposits have been re-examined with a view to beginning mining operations. There seems to be little doubt that there are a number of claims having lodes that will yield from 0.5 per cent. to 1.75 per cent. metallic tin.

In North Carolina placer deposits have been developed about 2½ miles southwest of Kings Mountain in connection with the veins on the noted Le Doux property. Prospecting in the lode mines has been prosecuted in the various properties of the region.

Fifteen miles north of El Paso, Texas, in the Franklin Mountains, a considerable amount of prospecting has been done on the veins which have been known for several years, and five veins have been uncovered through distances varying from 300 to 600 ft.; two smaller outcrops have also been uncovered.

During the year an attempt was made to smelt some of the old concentrates at the Cajalco mines near Corona, Cal., but the furnace "froze" with the tin distributed through the slag in the form of shot, and the effort was given up. Prospecting has been continued in Trabuco Canyon, in southern California, and a small quantity of ore was produced, but none has been concentrated.

No new occurrences were reported from Idaho during the year, but some interest has been shown in the little known stream tin deposits near Salmon.

Production in Foreign Countries.

Owing to the very high price of tin during the year 1906, prospecting for the ore was greatly encouraged all over the world, but in spite of this the output of the Federated Malay States, the principal producer, was somewhat less than that for 1905, as that had been less than the production of 1904, because of the impoverishment of many of the shallower and richer placers. The high price, however, allowed the working of ground which would have been much too poor to work under the prices existing in previous years. During the year the British Government, with a view to retaining the smelting of tin in the Federated Malay States, increased the export tariff on the ore. The production of tin in these states in 1906 was 54,584 net tons as against 57,178 net tons in 1905, a decrease of 2594 net tons. It is probable that the mining interests there will have to depend more and more upon the mining of lode tin. At present no large lodes are known, but there are many comparatively narrow veins which it will pay to develop.

Much prospecting has been carried on in Siam during the year, and tin is being worked in 21 provinces. The annual production is estimated to be about 5000 net tons.

The Imperial Maritime Customs reports that during 1906 China exported 4538 net tons of tin, against 5020 tons for 1905 and 3359 tons for 1904. Only high prices bring the Chinese tin into the open market. The mines are said to be largely alluvial, only the upper and softer parts of veins being worked.

Under the influence of the high prices the output of Banka and Billiton was increased over that of 1905. A total quantity of 2158 net tons was sold by private tender at Batavia during 1906, and 269,324 slabs, equal to 10,055 net tons, of Banka tin were sold in Holland during the year. The production of Billiton for the year 1905-1906 was 4997 net tons. There has been a gradual decrease in the tin mined in these two islands during the last 10 years, except for the considerable recovery within the last two years, owing to the rise in price.

As in other countries, tin mining received a great impetus during the year in Australia, with the result that there was a considerable increase in the output, especially in Queensland, where the increase came largely from the lode mines. The production for the year was 5402 net tons, valued at \$2,385,962, the largest output for any year since 1874, being an increase of almost 1000 tons of ore over the production of 1905. The total yield of tin ore for Tasmania was 5010 net tons. Tin mining was carried on in the Greenbushes and Wodgina fields of Western Australia, but the quantity produced is not at hand. A large part of the ore is shipped to Singapore for reduction.

Important Developments in Bolivia.

The bulk of the output of Bolivian tin is derived from lode mining, although there are workable placers which at times give a small output. However, the output has become so great that it is playing a considerable part in the world's markets, and there was substantial increase during 1906 over the output of 1905. Only a small part of the Bolivian output is smelted in Bolivia, most of it going to Germany or to England for reduction. Owing to the fact that most of the tin ore of Bolivia is shipped as barilla, or concentrates, the figures of production are quite uncertain, varying greatly as given by different authorities. According to William B. Sorsby, American minister at La Paz, the Bolivian tin production (exports) in 1906 was 32,375 net tons of barilla, or 19,425 net tons of metallic tin. During the year new deposits of tin are said to have been discovered, in the province of Cochabamba, east of the deposits worked at present.

The high price of tin has caused the reopening of a number of old mines in Cornwall, and this rejuvenation is still going on. In the mines already in operation the present price of tin allows ores hitherto impossible of working to be taken out at a profit. The ticketings (fortnightly offerings of ore for sale) for tin during the year in Cornwall, in which county are all of the producing English tin mines but one (whose output was $8\frac{1}{2}$ tons of ore), amounted to 6690 net tons, against 6493 tons for 1905. These are estimated quantities, but they are probably not far from correct, and afford a fair comparison for the outputs of the two years. They do not include tin ore obtained by "streaming" in the Red River, nor tin ore sold by private tender. Much tin ore is shipped into Cornwall from foreign countries for smelting.

Small quantities of tin are produced in Austria, Finland, France, Germany, Portugal, Spain, Burma, Transvaal, Swaziland, Congo Free State, and Nigeria. Prospecting has been carried on during the year in Mexico, New Zealand, Nova Scotia, and Siberia, but without production, except 405 tons in Mexico.

World's Production and Consumption.

The world's production in 1906, according to German statistics, was 108,500 net tons. In these figures, however, it is believed the Bolivian output is underestimated, while a small production in several countries is entirely ignored. It is therefore probable that the world's production in 1906 was between 115,000 and 120,000 short tons.*

The world's consumption of tin during 1906 is estimated as follows: England, 20,282 net tons; Germany, 17,086; France, 7496; Austria-Hungary, 4079; Belgium, 3086; Russia, 2756; Italy, 2756; Switzerland, 1543; Spain, 1433; Norway, Sweden and Denmark, 992; Netherlands, 276; other European countries, 882; United States, 48,170; other American countries, 1433; Australia (estimated), 661; Africa, 220; Asia, 496; other countries, 551; total, 114,198.

From the most reliable figures it appears that the production of tin in 1906 was from 6000 to 8000 net tons greater than in 1905, from which it would appear that the output in 1906 not only fully covered, but was somewhat in excess of the consumption for the year. W. L. C.

The New England Foundrymen's Association.

Henry F. Arnold presided at the monthly meeting of the New England Foundrymen's Association, at the Exchange Club, Boston, October 9, in the absence of President W. H. Bense. It was a most successful meeting, with a large attendance of members and their friends. The E. H. Mumford Company, Philadelphia, was unanimously elected to membership. The committee appointed to take action on the death of D. B. Lincoln, Wollaston Foundry Company, Wollaston, Mass., presented resolutions which were accepted. After dinner the evening was given up to a paper on the subject of the universal system of machine molding, which was elaborately set forth with illustrations by cinematograph views showing machines in actual operation in the foundry, with the operator in the act of making a mold, from the mixing of the sand to the closing of the cope and drag, ready to pour. The paper was by E. Ronceray of Ph. Bonvillain & E. Ronceray, Paris, but at his request the description and general remarks were given by E. H. Mumford, E. H. Mumford Company, Philadelphia, which company has recently taken the selling agency of these machines for the United States. The evening ended with a moving picture entertainment accompanied by music.

The Cost of Riveting.—The following comparison of the cost of machine riveting and pneumatic riveting is given on the authority of the Chester B. Albree Iron Works Company, Allegheny, Pa. Since a machine will drive rivets as fast as they are fed to it, the chief cost is that of handling the work. This varies with the class of work, heavy and bulky work being of course harder

to handle. Assuming \$4.50 a day for the labor, exclusive of the heater, if a machine drives some 700 or 800 rivets a day the cost for labor, power and general charges will be from $\frac{5}{8}$ to $\frac{3}{4}$ cent per rivet. Pneumatic hammer rivets in ordinary shop work will cost hardly less than $1\frac{1}{2}$ cents per rivet for similar charges. Assuming only $\frac{1}{2}$ cent saved per rivet, there is \$1000 or \$1200 saved per year. A much greater saving will generally result for if double the machine rivets are driven per day the cost per rivet is practically cut in half. This comparison applies only to an air machine which for 2500 rivets takes about the same amount of air as one pneumatic hammer. Rivets driven by hydraulic pressure are more expensive; several hundred dollars additional must be allowed per year for power.

The New Departure Automobile Bearing.

An interesting exhibit will be made at the coming automobile show in Madison Square Garden, New York City, November 2 to 9, by the New Departure Mfg. Company, Bristol, Conn. A special feature of this exhibit will be the ball bearing invented by Albert F. Rockwell, president of the company. Although an annular ball bearing, and hence primarily intended for taking radial load, it will also take end thrust, by virtue of its special



The New Annular Ball Bearing Made by the New Departure Mfg. Company, Bristol, Conn.

construction. In reality the new bearing is two bearings in one, since it has two rows of balls and two ball races. The bearing is guaranteed to take a radial load twice that of any other bearing of the same size, and an end thrust nearly equal to its radial load capacity.

The illustration herewith shows one of these bearings partly broken away to expose the construction. The design is such that the load is evenly distributed between the two rows of balls employed, the vertical load being divided into diagonal components acting to either side. The bearing may therefore be used as a substitute for the two bearings usually required in an automobile where both end thrust and radial load are present. In such parts as a bevel gear bearing, where the line of strain is at right angles with the base of the teeth on the gear, the direction of the load is intermediate between that of a radial one and that of an axial one, and is amply provided for in a single bearing of the construction illustrated. The separator is designed to permit a large number of balls, and is supported by the two rows of balls without friction against any stationary part.

The bearings will be made of standard bores and outside diameters, and will be fitted with balls made by the company's special process. Present indications have led the manufacturer to anticipate need of increased facilities for making the bearings, and a large addition to the present plant is now nearly completed, which will shortly be given over entirely to this work. It is stated that many automobile manufacturers have already specified the new bearing for their 1908 product.

* These figures indicate that the estimate of 93,919 gross tons, or 105,189 net tons, published in *The Iron Age* of June 13, 1907, was too low.

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						HARDWARE EDITOR.

The Question of "Dumping."

Discrimination in prices on domestic and export business is neither local nor national. It is apparently as live an issue across the water as at home. Some weeks ago the Scotch manufacturers of steel plates agreed to limit production in an attempt to correct the difficulties arising from the cut prices of jobbers who were receiving plates from the mills under old contracts made on a considerably lower basis. Now the low prices the same mills are quoting on business outside of Scotland are causing a great commotion among shipbuilders and other users of plates. The manufacturers maintain a base price of £8 7s. 6d. on boiler plates, to all buyers in the Clyde Valley. Earlier in the year only slight concessions were made on foreign business, but lately low figures have appeared, not only on such export business, but to buyers in Belfast and in several English districts, the concessions having amounted in some cases to 20s. a ton.

The London *Economist* says the Scotch consumers of plates, finding themselves seriously handicapped in competing for work in the open market, are in arms.

Orders for tanks for South America, specified to be made of Scotch steel, have gone to Germany, because local constructors were required to pay £7 12s. 6d. a ton, while the German builder got his plates about 20 shillings a ton less, and after paying carriage had a clear profit. Such instances could be multiplied. . . . It may fairly be asked that, for all material which is to be used up in outside contracts, prices at home should be no higher than those asked from foreign constructors. Makers would be no worse off in the first instance than in the second, and that course would keep money in our purse—to the mutual advantage of employer and employed. The same causes of complaint exist in the North of England, though to a slighter extent. And it will be well for the steel makers in both districts if they take thought and mend, else when the next period of depression sets in and foreign steel is more plentiful in this market than it is at present, British consumers may be more liberal buyers than in other circumstances they might be inclined to be.

The statement has a familiar ring. Last year German buyers of billets and sheet bars from the Stahlwerks Verband made such vigorous protest against the sale of semi-finished steel to their British competitors at low prices that the syndicate announced that it had practically discontinued "dumping" steel in Great Britain. It was questioned at the time whether the protection of home patrons had as much to do with the change of policy as the fact that home demand was putting all steel making capacity under strain. On this more light will be shed by what happens when the German Syndicate as well as the United States Steel Corporation finds the home market unable to keep domestic steel mills busy.

In the United States the protest of a lake shipbuilding interest against the sale of American made plates to British shipbuilders at lower prices than those prevailing

at home parallels the complaint now going up from builders on the Clyde. It is a troublesome question wherever met with, and it has not the exclusive relation to a protective tariff that has many times been assumed. The solution suggested above for the Scotch situation that the home buyer be given the same prices as foreigners on that portion of his purchases intended for export work is not a new one. Some years ago the president of the Illinois Steel Company brought before certain large sellers of Lake Superior ores the proposition that lower prices be made on ore entering into export steel. He argued that the steel maker should not be required to assume all the burden of the concessions compelled by the competition he met in foreign markets. If he could get lower raw materials he would be willing to take foreign business yielding no profit, for the benefit coming from more continuous operation of plant. The argument did not appeal to the Lake Superior ore producers, who replied that there was no object in sacrificing to the export trade ores that could not be replaced and that would all be needed eventually at home.

When all has been said in favor of such special arrangements applicable to export material, the fact remains that the manufacturer for whom the concession is made may in turn be giving a lower price to his foreign customer than he is quoting even to the largest buyers at home. Thus the charge of discrimination, whatever weight it should carry, is not disposed of. One important complainant may have been satisfied, yet the fact of a lower price to meet foreign competition remains.

So far as the iron trade is concerned, there are factors in the international situation that may in time work for steadiness, with a minimum of disturbance from the raiding of distant markets. Manufacturers in the leading iron and steel countries have had in recent years a taste of the benefits of greater concentration and co-operation, with a growing disinclination for slaughtering competition. To an increasing extent the economy of husbanding raw materials by shortening output in times of diminished consumption will commend itself. The drift in all countries, in view of the pre-emption of ore supplies, is away from small and weak operations, with their menace to values in lean times. The periods in which dumping will have any attraction will tend to be briefer and farther apart. Indeed, the greater strength of the contestants will conduce to peace rather than war.

Optimism in a Falling Market.

Personal contact with a large number of manufacturers in New England in a wide diversity of metal lines the past fortnight has revealed the significant fact that without a notable exception every one is exceedingly cheerful in the face of a materially diminished volume of new orders. Each believes that his own attitude is affecting the market by curtailing the demand, for he is buying his raw materials carefully, and usually from hand to mouth, waiting until he can feel sure that prices have been readjusted to a new basis. Each manufacturer also realizes that his own customers are holding back for the same reason. There is a complete understanding that stocks of raw materials and supplies are being greatly reduced, but that in spite of this fact current wants are totalling no inconsiderable volume of new business. The feeling is that nothing is wrong with basic conditions of the country and of the foreign market; that the influences that are affecting the market are artificial, and, on the whole, superficial.

Going back to certain speculative influences, notably

in copper, these manufacturers argue that a drop in prices has resulted in an inevitable cessation of buying, not only in this country but in Europe, where customers are showing a tendency to wait before placing orders for American manufactured products, for the same reasons that have affected the market at home. It is believed that the present period of unrest is already nearing its end; that the trade dampening atmosphere is clearing away. When this new condition of business shall have arrived there will be need of replenishing depleted stocks by heavy purchases in every line of manufactured product, each industry helping the other, and the merchant and consumer helping them all.

The French Tool Steel Swindle.

Time and again we are reminded that a swindle to be successfully perpetrated need not necessarily be new. Nor indeed are the victims of cleverly devised and skillfully handled schemes always members of that unsophisticated class popularly supposed to form the exclusive clientele of "gold brick" merchants. It may be remembered by some of our readers that attention was called in an editorial article in *The Iron Age* of May 14, 1903, to questionable transactions of certain French steel salesmen, who appeared in this country offering what was represented to be a tool steel of exceptionally high grade and quality.

At that time much interest was being manifested in high speed steels, the advantages of which were being closely investigated by tool users. It was, therefore, not difficult to secure the interest of manufacturers in a proposition which, as stated by the plausible Frenchmen, was full of alluring attraction. It was explained that this steel was manufactured of iron, made from ores obtained in Algeria, and that the source of supply was extremely limited and controlled by a manufacturer in Paris, whom they represented. The price asked was 49 cents a pound, from which no deviation was made under any circumstances or for any quantity. Upon receipt of his consignment, the purchaser invariably found, however, that the quality of steel furnished was not as represented. Careful analysis in many instances showed the steel to be an ordinary tool steel, which would not in any market command above 8 to 10 cents a pound, and in every case the quality furnished could be purchased anywhere for one-quarter or less of the price paid. This discovery, however, was frequently not made until payment of the invoice had been forwarded, and in other cases, even where the facts were disclosed prior to settlement, the bills were paid or were compromised on a liberal basis in order to avoid trouble. As a rule, the amounts involved were not large, as the ostensible object was the introduction of the steel through sample or trial orders. But frequent sales of even a few hundred pounds each at the comfortable margin yielded would, of course, make a highly profitable business.

Considering the number of people who were duped by this audacious swindle—for they were by no means few—and the publicity that was given it at the time, it is rather surprising to find it again being openly worked in this country. The brazen effrontery displayed by these operators is strikingly illustrated by the fact that the same old scheme without change or modification is being offered. Unfortunately for the success of their plans, two of these representatives were recently confronted by one of their former Chicago customers who promptly denounced them and disclosed the fraudulency of their claims. The fact that orders taken are actually executed by shipments of tool steel leaves ground for no other

charge than that of fraudulent misrepresentation as to quality, and the difficulty of establishing such a charge will readily be appreciated. There is particular danger of well-informed persons being inveigled by the smooth representations of the French salesmen, from the fact that they are careful to come with letters of introduction from responsible parties. Just how these are secured is, of course, not understood. It will be well, therefore, for buyers to scan with the closest scrutiny any offers of steel of an unknown brand, from parties whose trustworthiness cannot be unquestionably established.

Producer Gas Apparatus and Engines.

Perfection, or even a close approximation of it, is rarely realized in the first concrete forms of a mechanical idea. While the underlying principle embodied in the design and construction of a new machine may be essentially correct, its practical application is apt to develop many unforeseen difficulties and shortcomings. The truth of this has been fully exemplified in the introduction and development of producer gas apparatus and engines. Due to crudity of design and other causes that resulted in imperfect operation the earlier types of gas producers met with scant favor; but subsequent improvements, the outgrowth of critical study and experimentation, have advanced them to a position of prominence in the field of motive power. It is realized that the possibilities of further achievement in this direction are great, but at the same time it is also recognized that there are imperfections yet to be overcome, both in producer apparatus and in engine types used in connection therewith.

In a paper on the present status of the producer gas power plant in the United States, prepared by Robert Heywood Fernald, professor of mechanical engineering, Washington University, St. Louis, also engineer in charge of producer gas tests of the United States Geological Survey fuel testing plant in that city, the principal difficulties encountered in commercial practice are reviewed and discussed. It is explained that in order to get a comprehensive knowledge of the present status of the business the views of a large number of manufacturers, owners and operators of existing plants were sought through a series of questions addressed to them, designed to elicit pertinent information. A feature of hopeful significance apparent in the replies received was that, while there was uniform agreement as to the growing demand for gas producer motive power, there was, on the other hand, no inclination shown to ignore the existence of obstacles yet to be surmounted in order to assure that perfect reliability, under the varying requirements of service and different kinds of fuel, which is the measure of complete success. A summary of these replies seemed to indicate a consensus of opinion to the effect that public confidence had been impaired by the large number of earlier installations which had proved either unsuccessful or only partially successful; that the suction gas producer suffered limitations on account of its inability to use cheap fuels; that there was need of a producer type that would satisfactorily gasify bituminous coal, and in this connection it was noted that knowledge of how far different fuels in various localities can be successfully used in gas systems was very incomplete. Other deterrent influences named were the relatively high costs of installations, lack of experienced operating engineers and the incompetency of salesmen, whose prodigal guarantees often failed of fulfillment.

A year has elapsed since these communications were received, and in the meantime marked advance has been

made, the elimination of many of the difficulties noted. Much reliable data have been gained respecting the use of various kinds of bituminous coal through the investigations of the fuel testing plant referred to. Two of the pressure and down draft type producers now on the market are using bituminous coal and other fuel with reasonably good results. Quite a number of such plants are in successful operation.

From figures secured from leading manufacturers it is ascertained that in point of cost, gas producer plants of 4000 or 5000 hp. up compare favorably with steam plants of the same size. Though strong emphasis is laid upon the hurtful effects of the incompetent handling of gas producer equipment by engineers unfamiliar with its operation and the absurd guarantees of poorly informed salesmen, it is evident that these are obstacles which will be speedily removed as such plants become more common. Even now these objections have far less weight than when they were formulated, and they will continue to decrease steadily under the careful study and attention now being given gas producers as an economic factor in power production. Gas producers and gas engines are bound to occupy an increasingly important place in industrial affairs and the work accomplished by the Geological Survey in fuel tests and collateral experiments has materially advanced the interests of this industry.

CORRESPONDENCE.

Mechanical Puddling.

The Danks Revolving Puddling Furnace.

To the Editor: Some time since I read an article in *The Iron Age* on the Roe puddling furnace at Pottstown, Pa., and later in looking over No. 3, 1906, of the *Journal* of the Iron and Steel Institute I found a paper read by E. P. Roe on the development of the Roe puddling process, indicating that there is an undoubted revival of interest in the subject of mechanical puddling due to the very persistent demand for a good quality of puddled iron that can be placed on the market in some sort of competition with soft or mild steel. My object in addressing you on this subject is first, the belief that a review of the history of mechanical puddling would be of interest and value to those thinking and working along these lines and, second, to correct some wrong impressions that appear in the above named paper and the discussion following its reading, as to the results obtained in the Danks revolving type of puddling furnace.

The Danks Furnace Successfully Used.

In reference to the early history of mechanical puddling, I am mailing with this a copy of the scientific proceedings of the Ohio Mechanics' Institute of Cincinnati, Vol. II, June, 1883, on page 70 of which you will find a sketch of mechanical puddling read by the writer before the section of Mechanics and Engineering, February 27, 1883. At the time this sketch was written there were eight Danks furnaces in successful operation at the Cincinnati plant, which continued in operation until about 1885.

The retirement of Mr. Danks and his sons from the management of the Cincinnati plant, about a year before the concern failed, could not in any way be attributed to mechanical puddling, of which they never made a failure at the Cincinnati plant. The chief reason for not pursuing the matter further at some other location was the belief, which at that time was shared by many men in the iron business, that in a few years at most puddled iron would be a thing of the past, as it was believed that open hearth steel would fill every requirement of the market with a cheaper and better material than could be produced by any other method.

It is not my purpose to detract in any way from

what Mr. Roe has accomplished in the way of mechanical puddling nor to offer any criticism on his furnace. He certainly deserves great credit for the amount of success attained along the lines pursued, which is only one more evidence that there is generally more than one way of reaching the same result, and finally it becomes merely a choice of methods. In the body of Mr. Roe's paper, however, I find the following statement in reference to the Danks furnace and others of the revolving type:

They succeeded in reducing the manual labor of puddling and balling the iron, and possessed the important feature of working on a hot bottom. They looked very promising but ended in failure as far as producing puddled bar was concerned, and their product was only available as stock for the open hearth furnace. The shortcomings common to all were the excessive time and labor required for fettling.

Quality of the Danks Product.

The statement that the stock made from the Danks revolving furnace was only available for stock for the open hearth furnace is so much at variance with the facts in the case that I am very much surprised to see it in print, especially in the *Journal* of the Iron and Steel Institute, as the records of that body contain an exhaustive report of a commission it appointed in 1871. The very excellent results as to quality of product detailed in that report were the every day record of the writer's experience with the Danks revolving type of furnace, both as a puddler and manager, covering a nearly unbroken period of 17 years. Many thousand tons of puddled iron were in that time made directly from blooms of 600 to 1000 lb. each without piling, and were rolled into rail heads, boiler plates, tank plates and merchant bar of excellent quality. During that entire period I only know of one concern that used the product of the revolving furnace for open hearth stock and that was the Otis Steel Company of Cleveland.

The revolving type of furnace was a slow melter. The regular daily practice for years was eight heats of about 1000 lb. each, which occupied about 10 hours, the other two hours out of every twelve being devoted to making two meltings of cinder to keep the lining in repair. The puddling proper after the iron was completely melted only required from 20 to 30 minutes.

Quoting again from Mr. Roe's paper, he makes the following criticism of the Danks furnace: "The difficulty of drawing the ball or balls, the trouble connected with the fact that the lining was alternately serving as roof and bottom so that pieces of the fettling dropped off and were inclosed in the ball, and worst of all the balling of the heat before the iron was ready, and the impossibility of modifying or delaying it in any way, which resulted in raw iron in the ball and blisters in the finished product."

How the Danks Revolving Furnace Worked the Iron.

The regular daily practice at the Cincinnati Works, in drawing the heat of 1000 lb. in one ball and charging another heat, was not over two minutes from the time the fastenings of the removable flue were released until they were again in place and the melting of a new charge begun. The removal of the heat from a revolving furnace, whether it be 1000 lb. or a ton, is a very simple proposition. The fact that the lining of the furnace was alternately serving as roof and bottom was one of the greatest advantages of the revolving type of furnace, as it insured a uniform temperature to all of the iron during the period of puddling and balling. After we learned that it was not necessary to use raw (or unmelted) ore in renewing the working lining, the trouble from raw ore or particles of the lining in the ball seldom ever occurred.

The statement that the worst feature of the revolving furnace was the necessity of balling the iron before it was ready and the impossibility of retarding the process during the "drop," with the result of "raw iron in the ball," is another complete surprise to the writer, for, with the iron first properly melted, every particle of it was certain to be worked alike. When the drop began, our invariable practice was to reduce the speed of the furnace from about 10 revolutions to 1 rev. per min., thus retarding the balling and exposing every particle of the charge to the flame action, and, when it was

desired to form the ball, the furnace was stopped for a short time to allow the grains of iron to unite. While the mass was still soft, a partial revolution was given to make the ball round instead of allowing it to assume permanently the shape of the furnace lining. I wish to make the statement very emphatic that in all my experience with the Danks revolving furnace (when the iron had once been properly melted) I never saw a heat of iron puddled in which the center of the ball was not the same as the outside, even when the process was stopped sufficiently early in the "drop" to produce steel that readily hardened into tools. It was entirely uniform throughout the mass. I do not consider it possible under fair conditions in a revolving furnace to produce a heat of iron which is not all alike, except where the cylinder of the furnace is too long in proportion to its diameter, which was found to be the case in the second experimental Danks furnace built in 1869.

The Blisters Came From the Fuel.

That there was sometimes trouble from blisters in the iron made in the Danks furnace is true, and yet many tons of sheets and plates were made that were free from blisters. As the trouble from blisters continued after the use of raw ore in the working lining was stopped, careful research into the cause proved conclusively that it was not from any fault in the puddling, as part of the same bloom which blistered, when made into sheets or plates, was found to be of very excellent quality when rolled into merchant bar; just as many a heat of open hearth steel to-day may be rolled into merchant bars and shapes, and stand almost any sort of punishment, but could not be made into sheets or plates and pickled or galvanized without blistering very badly, proving that there was in the texture of both the iron and the steel some foreign substance that would not allow the grains to unite. In the steel it is most commonly traced to particles of slag, while the most common cause in the iron from the Danks furnace was from small particles of coke, which were carried over the bridge wall by the blast used to urge the fire, and which could not be squeezed out nor melted in the after workings.

We proved to our entire satisfaction that blistered material was in no way due to the type of furnace, nor to the puddling proper, but was an incident to the best fuel available at that time for the purpose; with oil or gas for fuel this difficulty would disappear, though it should always be remembered that in making iron sheets and plates there always was more or less trouble from blisters in high grade iron, which never appeared in that of low grade. The reason of this is that high grade irons always carry a slag of much higher melting temperature than is present in weaker grades, no matter by what process they are made.

The Bleeding of Iron.

I am aware that there has always existed a difference of opinion on the subject of "bleeding" the iron in a puddling furnace, but this matter was very carefully tested out at the works in Cincinnati. Our best practice was the use of a liberal quantity of squeezer or roll scale charged with the heat, to be used as a refining agent, and the removal of the surplus (before the boil began) down to a point where there would be none left in the furnace when the ball was withdrawn. It was found by this practice that the grains of iron were smaller, the yield was greater and the iron was stronger than when an excess of slag containing all the impurities of the pig iron was allowed to remain in the furnace.

We met with many grades of iron low in silicon and phosphorus that did not require "bleeding," and such irons were always easy on the furnace lining, so that the treatment of the charge in a puddling furnace should be dictated by the analysis of the pig iron and the purpose for which the product is to be used, just as in the best open hearth practice. The character and condition of the slag present in the furnace are always a good index to the physical qualities of the iron or steel. The squeezer, which was used to deal with mechanically puddled iron, was always too weak to make a good, solid bloom. We made plans for a much heavier machine, which was never built, but I see no reason why the re-

volving type of squeezer should not be built for treating puddled balls of any size that would leave nothing to be desired in the way of sound compact blooms.

In conclusion, permit me to say that the conditions mechanically are very different from what they were 30 years ago, and that with a modern mixer furnishing iron directly from the blast furnace, oil as an ideal fuel, steel castings for construction, electric motor for driving and a traveling crane specially suited to charging and drawing, mechanical puddling should be a much easier proposition than it was at that time. With operating and mechanical conditions as above stated, a revolving puddling furnace could be depended on to produce a puddled ball of one or two tons weight every half hour for 10 hours, leaving 2 hours out of every 12 for removal of the lining. With the cylinder of proper proportions, the quality of the iron all through each charge would be uniform, without any regard to the size of the heat. As long as there is to be a market for a high grade of iron it should be puddled by machinery.

J. G. DANKS.

CINCINNATI, OHIO, October 7, 1907.

British Pig Iron Production in 1907.

Statistics of the production of pig iron in Great Britain in the first six months of 1907 show a total of 5,194,721 gross tons, which compares with 4,905,424 tons in the first half of 1906, and 4,621,600 tons in the first half of 1905. The production in the first half of 1907 was at a rate for the year of 10,389,442 tons. In 1906 the production of pig iron in Great Britain was 10,149,388 tons. Below is shown the distribution of the output for the first half of this year among the various kinds of irons and a comparison with the first half of 1906:

	First half 1906.	First half 1907.
	Gross tons.	Gross tons.
Forge and foundry.....	2,148,273	2,295,918
Hematite	2,009,276	2,103,248
Basic	630,660	626,337
Spiegeleisen, ferro, &c.....	117,215	169,209
Totals.....	4,905,424	5,194,712

The greatest output of forge and foundry iron was that of the Cleveland District, with a total of 702,347 tons. The same district made the largest total of basic iron—namely, 191,915 tons. The chief producer of hematite or Bessemer iron was West Cumberland, with a total of 480,746 tons.

The average number of furnaces in blast in the half of the year ending June 30, 1907, was 378, against 363 1-3 in the first half of 1906. The average number out of blast was 134 in the first half of this year and 151 2-3 in the first half of 1906. The total number of furnaces in the United Kingdom on June 30, 1907, was 512, of which 102 were in Scotland.

The office of Public Roads, Department of Agriculture, has published the results of an exhaustive inquiry into the extent and condition of public roads in the United States. An "improved road" is defined as a highway graded, drained and surfaced with a material or combination of materials or treated with the application of some preparation resulting in a reasonably smooth, firm and durable surface. In 1904 there were 2,161,570 miles of public road in the United States of which 7.14 per cent. had been "improved." Of these improved roads 108,233 miles were surfaced with gravel, 38,622 miles with stone, and 6810 miles with special materials like shells, sand clay, oil and brick. In the whole country there is 0.73 miles of road per square mile of territory, or 1 mile of road to every 35 inhabitants and 1 mile of improved road to every 492 inhabitants. In 1904 the expenditure on the public roads, including cost of bridges, was \$80,000,000.

Rumors to the effect that the Commercial Club of Muncie, Ind., is contemplating raising funds for the erection of a new rolling mill to take the place of the American Rolling Mill recently shut down are without foundation. It is said that no steps will be taken in this direction for at least a year to come.

Tariff Revision Agitation.

WASHINGTON, D. C., October 15, 1907.—The Congressional leaders, who in the main are also the chief supporters of the stand-pat tariff policy, are preparing to meet the latest move of the tariff revisionists who are now urging the relegation of the whole question to a national commission, to be appointed by the President. The commission plan is objectionable to the men who rule the Senate and House for two reasons: First, because it means the thorough overhauling of the Dingley act at an early date; and second, because it would turn over to an independent and presumably a nonpartisan commission the most important legislative function exercised by the Congressional leaders and deprive them of an enormous amount of influence, which they have heretofore wielded by reason of the fact that the great industries of the country must depend upon the wisdom of Congress for the tariff rates, which, on the one hand, add to the cost of raw materials, but, on the other, obstruct the importation of unlimited quantities of competing products.

Revisionists Seek Pledge.

The plan of the advocates of a tariff commission involves no little agitation of the subject of revision in the coming Congress. Accepting the assurances of the Congressional leaders that serious consideration will be given to the question of the advisability of revising the tariff immediately after the next Presidential election, the advocates of the commission plan insist that a pledge of the intention to overhaul the tariff law and to deal with this important subject in a businesslike way should be given during the coming Congress by the passage of a joint resolution authorizing the President to appoint a commission before the end of the last session in March, 1909. It is urged that the passage of such a resolution next winter would not only be wise from a business standpoint, but politically expedient, as it would constitute a pledge to the country of the early revision of the tariff without precipitating the uncertainty and anxiety that must accompany the actual work of revising the schedules.

The advocates of the commission plan point to the fact that President Roosevelt is practically committed to it, and has gone so far as to favor a permanent body, which would not only "take the tariff out of politics," but would make it possible to correct inequalities in rates from time to time and thus avoid the tremendous business upheaval that usually results from the enactment of a law making changes in practically every schedule of the tariff. Soon after President Roosevelt entered the White House he made a speech at Logansport, Ind., in which he strongly advocated legislation by Congress creating a permanent tariff commission. Referring to the attitude of such a commission toward the industries of the country, he said:

President Roosevelt's Views.

"It would recognize the fact that as our needs shift it may be found advisable to alter rates and schedules, adapting them to the changed conditions and necessities of the people, and this would be in no wise incompatible with preserving the principle of protection, for belief in the wisdom of a protective tariff is in no way inconsistent with frankly admitting the desirability of changing a set of schedules when from any cause such change is in the interest of the nation as a whole—and our tariff is designed to favor the interests of the nation as a whole, and not those of any particular set of individuals, save as an incident to their building up a national well-being."

The Congressional leaders make no direct answer to the representations of the advocates of a tariff commission. They are not idle, however, and the majority members of the Ways and Means and Finance committee are watching developments with a jealous eye. Influence is already being brought to bear upon new members of the House to stand out against the commission idea, and the House organization will be relied upon to distribute places and patronage in the new Congress so as to

strengthen the sentiment against the commission project as much as possible.

There can be no question that the men in Congress who for the past two years have sat upon the tariff revision lid, so to speak, are greatly disturbed, not only on account of the demand for revision now being voiced in many sections, but especially because of the strength of the sentiment in favor of a commission. The latter proposition is an awkward one to oppose, and the leaders fear lest some member of the majority in the House may seize the opportunity to make a name for himself by coming out squarely for a tariff commission pledged to an early overhauling of all the schedules. It would be in accordance with precedents if the President, in the event of the passage of a joint resolution creating a commission, should appoint its principal advocates in Congress to places upon it, for it is assumed here that a part, at least, of the membership would be selected from the two houses.

Current Revenue Tendencies.

The Ways and Means and Finance committee leaders are greatly interested in the current revenue tendencies and are following with considerable anxiety the periodical statements showing the condition of the Treasury. A recent table prepared for the Secretary of the Treasury contains some especially interesting statistics. From these data it appears that on October 9, 1907, there was a deficit of \$2,940,749, as compared with a surplus of \$4,605,145 on the corresponding date a year ago. These figures represent a little more than three months of the two fiscal years and are quite significant when it is remembered that in the fiscal year ended June 30, 1907, there was rolled up a surplus of approximately \$87,000,000. The total receipts from all sources in the current fiscal year to date amounted to \$183,859,744, as compared with \$175,787,472 a year ago. The expenditures for the current year have aggregated \$186,800,493, as compared with \$171,182,326, from which it will be seen that the current deficit is wholly due to increased expenditures. Both customs and internal revenue receipts show normal gains. The revenue from customs for the current year is \$92,864,971, as compared with \$90,547,306 for the corresponding period last year, while from internal revenue the total for the current year is \$74,451,194, as compared with \$72,650,907 a year ago.

The statistical statement referred to shows these figures for the eight years 1900 to 1907, inclusive, and constitutes a very interesting exhibit as follows:

Treasury Receipts for the Fiscal Year to October 9.

Year.	Total.	From customs.	From internal revenue.	From expenditures.	Surplus or deficit.
1900.....	\$160,680	\$66,869	\$85,089	\$158,639	+\$2,040
1901.....	156,357	68,749	79,505	137,694	+18,662
1902.....	161,692	85,897	64,831	150,626	+11,065
1903.....	157,518	78,903	66,331	153,825	+3,695
1904.....	153,305	72,310	65,978	170,941	-17,635
1905.....	162,504	82,941	68,430	173,568	-11,064
1906.....	175,787	90,547	72,650	171,182	+4,605
1907.....	183,859	92,864	74,451	186,800	-2,940

The above figures represent millions, the hundreds being omitted.

Receipts from miscellaneous sources are not shown in this table, but in each year they constitute the difference between the sum of the receipts from customs and internal revenue and the total receipts. It will be noted that, with the exception of the abnormally large customs receipts in 1902 and 1903, there has been a gradual upward tendency throughout the past eight years. In the item of internal revenue the abnormally large figures in 1900 and 1901 were due to the collections under the Spanish War revenue act, which increased practically all taxes except those on distilled spirits.

The Treasury experts, after a review of these figures, predict a small surplus on June 30 next, a prediction that is very gratifying to the stand-pat element for the reason that if it is verified there will be no argument in the condition of the Treasury for any change in rates of taxation, either customs or internal revenue. The advocates of revision, however, take the position that a skillful readjustment of the schedules need not affect the revenue in any way. The transfer to the free list of certain

classes of raw material now strongly advocated would undoubtedly reduce revenues from those sources, but on the other hand, moderate cuts in the duties on certain manufactured articles would so stimulate importations as actually to increase the customs receipts. Such results would, of course, depend upon the skill with which the revision is made, and the necessity for so careful a handling of a difficult problem is one of the strongest arguments advanced in favor of turning the whole subject over to a nonpartisan commission.

W. L. C.

Toronto to Have a Steel Plant.

Moose Mountain Ore to Be Used.

TORONTO, October 12, 1907.—The intimations that the City Council have from time to time received of Mackenzie & Mann's interest in Ashbridge's Marsh as a favorable spot for the establishment of great iron and steel works have now taken the form of a definite proposal. In the following letter, received by the civic authorities yesterday, D. D. Mann indicates what his firm desires and is prepared to undertake for the industrial reclamation of a large area of the marsh:

As you are aware, Moose Mountain, Ltd., is developing important iron mines in the township of Hutton, the northern terminal of the present Canadian Northern Ontario Railway. Development has so far proceeded that the mines will soon be on a shipping basis. Work on the railroad is expected to be completed to the mines by the end of January next. It is the intention of Moose Mountain, Ltd., to erect a smelting plant for the treatment of ore at some point in the province of Ontario. After mature investigation it is considered that Ashbridge's Bay, in the city of Toronto, would be a suitable location for this plant. I am authorized by the shareholders of Moose Mountain, in which my firm is also a shareholder, to enter into negotiations with the city for sufficient land at Ashbridge's Bay for the purpose of a smelting plant, with a capacity of treating 1400 tons of ore daily.

It is the intention of the company to establish from time to time industries that will manufacture pig iron into various products of iron and steel. The company intends to build its own tracks to serve the works, and thinks it desirable that there should be a transfer track, which all roads can use in common. Ultimately it is expected that a force of 15,000 men will be employed in the works, and the company asks the city to deed 350 acres when a smelter of the above capacity is in running order, and would ask that a tract of land be set aside to be deeded to the company when the other industries to which I have referred shall be built and in running order. Such a provision is necessary in order that the company may have sufficient land for the purposes of expansion.

I may say that the erection of works of this kind would very considerably increase the value of adjoining property. The company would require a shipping dock on its premises, and a slip from the waterfront to the dock. The whole of the remainder of the harbor front of the bay, which I understand it is intended to improve and make suitable for shipping, would be available for other purposes, and by reason of the erection of the steel plant would be an exceedingly valuable asset to the city.

The Proposed Site.

Though yet to be dealt with by the Board of Control and City Council it is safe to say that this offer will receive favorable consideration. In interviews published in the local newspapers to-day the Mayor, one of the controllers and the Commissioner of Industries and Publicities speak very encouragingly of the project, which is to come before the Board of Control next week. The marsh is nearly 1400 acres in extent, so that the 350 acres the company wants would leave three-fourths of it as sites for other manufacturing industries. Only about 10 acres of the whole area is filled in. It is practically a shallow inlet of the lake, from which it is separated by a sand bar. It was conveyed to Toronto by the Ontario Government, whose consent must be obtained before any part of it can be leased or deeded to a third party. The Government, however, is unlikely to withhold its approval from any transfer that is desired by the city. On its part the municipal government can be depended on to make the best of an opportunity to secure a great iron and steel plant on reasonable terms.

Toronto's failure to close with the offer of the promoters of the enterprise which finally became located in Hamilton has always been regretted, and the newspapers do not allow that mistake to be forgotten. They

periodically deplore it, and they now urge the City Council to make sure of the present chance, in so far as that can be done without any sacrifice of public interests. It is pointed out that other places could be chosen for the works, good inducements being said to be obtainable at Hamilton, Port Carling and other centers.

In an interview published in the *Evening Telegram*, Mr. Mann said that the idea of establishing the works in Toronto originated with John W. Gates, who is president of Moose Mountain, Ltd. Mr. Mann spoke as follows:

The concrete foundation in such a place will be very expensive, but Mr. Gates thought the favorable location would make up for the expense to some extent. He has had the whole district examined by an expert, and has soundings showing the class of bottom and all the particulars. Mr. Gates is in Europe at present, but was very anxious that the offer be made to the city at once, as we will be ready to ship ore by January at the latest.

The company expects to do a large export business, shipping the products by rail and water. We expect to manufacture bar iron, steel billets, rolled plates for ship armor, and all sorts of shapes for the building of ships and cars. Whether we will go into the building of cars ourselves has not yet been discussed, but the chances are that car building will be done by a subsidiary company.

Port Arthur Pig Iron Goes to Toronto.

Just at the moment when Toronto's attention is centered on Mackenzie & Mann's scheme to make Ashbridge's Marsh the site of iron and steel works, to be fed with ore from Moose Mountain mines, the first cargo of pig iron is being shipped from the furnace of the Atikokan Iron Company, at Port Arthur, to the Canadian Foundry in Toronto. This Port Arthur concern is also the outcome of Mackenzie & Mann's enterprise. In bringing it into existence the firm was actuated by the same motive as it is in its efforts to bring into existence an iron and steel plant at Toronto—namely, the desire to create traffic for their Canadian Northern Railway Company. As Mackenzie & Mann had an interest in the Moose Mountain iron mines on the Northern Ontario division of their railroad system, so they had an interest in the Atikokan iron range on the Rainy River section of their system. As they were successful in evoking an important iron manufacturing enterprise out of their relations to the Rainy River ore property there is excellent reason to believe that they will be successful in the proposed Toronto venture.

The blast furnace at Port Arthur has been steadily operated since it was first blown in, and now there is more than a sufficient stock of pig iron on hand for the loading of the steamer *Edmonton*, which is taking on its cargo there. This is an entirely new traffic, so new, indeed, that there is no freight tariff for the carrying of pig iron from the Canadian head of the lakes eastward.

C. A. C. J.

The Jones & Laughlin Steel Company completed October 1, 10 new rectangular coke ovens at its north side works, Pittsburgh, and put them in successful operation. These ovens are constructed on the general line of the ovens at Mt. Braddock, Pa., and were built with the object of thoroughly testing them out, as to the cost of their installation, cost of operation and character of coke produced; also the influence which the flues and stacks with which all the Jones & Laughlin Company's ovens are equipped, in order to do away with the usual smoke, would have on the resultant coke and the interior brick construction. Should the test be satisfactory, this type of oven will probably be installed at the company's new Aliquippa plant, and as the beehive ovens at the north side works burn out, they will gradually be replaced by ovens of the same kind.

The Pittsburgh Coal Washer Company, Pittsburgh, has installed a 1000-ton coal washer at the new coke plant of the Bessemer Coke Company, Millsboro, Washington County, Pa. All the coke plants of the Bessemer Coke Company in the Lower Connellsville field are equipped with this type of coal washer, which is said to be giving very good results.

Minnesota Iron Ore Values.

High State Appraisements for Taxation.

DULUTH, MINN., October 14, 1907.—The Minnesota State Board of Equalization has finally settled the taxable valuation of iron mines in the State—that is, St. Louis and Itasca counties—with slight additions in Lake and Crowwing, on the basis of the recommendation made by the Tax Commission, disregarding the protests made by mining and other northern Minnesota interests. This makes a total of about \$191,000,000. Of this amount Lake County is credited with a valuation of \$87,500, all in the property of the Shagawa Iron Company, the famous section 30-63-11. In point of fact, no one to-day knows if section 30 is worth a cent. It may be definitely stated that it has not yet shown itself worth nearly as much as the sums of money that have been expended there in litigation and exploration. Crowwing County, which is the Cuyuna District, is put at \$540,000, divided unequally between two properties held by Pickands, Mather & Co., neither of which is worth enough to induce that firm to mine it. The only development in the county that has shown any value is left out of the list altogether.

In Itasca County there are shown mines and prospects that are given a valuation of about \$12,000,000. All the rest is in St. Louis County. The Vermillion Range mines at Tower and Ely are given a valuation of \$2,300,000, and a tonnage of less than 10,000,000. The Itasca County mines are credited with about 106,000,000 tons, most of which is in the Western part of the county, in the new Coleraine District, where the bulk of the ore is too lean for shipment, unless concentrated. The Oliver Iron Mining Company is credited with a total of about 915,000,000 tons of ore in the ground, leaving but 250,000,000 tons for all others in the field. In addition to these returns there are areas of undeveloped, or unprospected lands in which future exploration may show more or less ore. Then, too, there are grades of ore in the mines already opened that while valueless now and perhaps for many years to come, will in due time be shipped if market conditions are right and too heavy fixed charges are not stacked up against them. The firm of Pickands, Mather & Co. is credited with about 31,000,000 tons, of which more than half is in the Scranton mine, owned jointly by this firm and the Lackawanna Steel Company, while about 1,000,000 tons of the remainder is on the Cuyuna Range. Corrigan, McKinney & Co. are given in the returns as holding but about 15,000,000 tons, of which only 2,500,000 tons is in their famous Stevenson mine near Hibbing. The general opinion has been that this mine contained more ore than is reported, but doubtless the firm's statement is correct and the public impression has been overoptimistic as to this mine. The latest comer among the mining concerns of the Mesaba is the New York State Steel Company, whose ore has been picked up within a year or a trifle more at top prices. It is interesting to note that this company has a tonnage of little more than 3,500,000 tons in three mines, all underground. The Mahoning properties include several unopened mines as well as the enormous body that is in operation. This company's total amounts to 73,000,000 tons, besides the unreturned prospects that are assessed at \$235,000. This list might be continued indefinitely, but would grow tiresome.

An Ore Belt Line.

The Minnesota Steel Company, which has been formed to operate the United States Steel Corporation's manufacturing enterprises in this State, has organized railroad companies to construct and operate belt lines of railroad about the head of Lake Superior, from points on the Duluth, Missabe & Northern road, over which its ore will come, to the extremity of Wisconsin Point, southeast of the city of Superior. These belt lines will circumscribe the territory of Duluth-Superior in such a way that no present or prospective railroad coming there will be able to get in without crossing them. There is now no such line at the head of Lake Superior, but the congestion of freight traffic is annually growing worse, so that this

project will be of the utmost value to the corporation in delivering its manufactured product for rail shipment anywhere. It will also be a considerable source of revenue, for it should be in demand by other roads not provided with sufficient transfer facilities.

New Work on the Mesaba Range.

M. A. Hanna & Co. have taken a considerable acreage in the southwest corner of 59-17, north of the Mesaba city of Virginia, and are beginning exploration there. If they find mines they will have developed a part of the range that, though long admittedly in the ore bearing formation, has never been proved to contain deposits of size. However, exploration has been confined to one 40-acre tract in section 32. They have several hundred acres belonging to Eastern interests, as well as a narrow wedged-shaped tract that has been in the courts for some years.

At the Gilbert mine, in 58-17, great work has been done this year. On February 1 it was a forest. Now there are a pit, from which more than 500,000 yd. of material has been removed; steel shaft houses covering two deep shafts, a number of buildings for shops, warehouses, engine and boiler houses, &c., and some ore is being mined and shipped. There are four shovels at the mine, one of which is working in ore in the pit, the rest in stripping. There are two shafts, one 175 ft. deep, the other 150, and both may be deepened considerably later and the property developed into an exclusively milling proposition. This is the newest of the Oliver Iron Mining Company's great developments.

Very little has been said of the Hoover & Mason grab at the Grant mine of Jones & Laughlin recently. The grab is working along in about the same manner as last year, unsatisfactorily and in a decrepit sort of way. There is very little to be said concerning it. Pettit mine of the Republic Iron & Steel Company is to sink another shaft, and will be prepared for a larger business in 1908 than before. Current local rumors as to the great tonnage this mine is expected to produce are incorrect.

Menominee and Marquette Activity.

Rogers, Brown & Co. are doing a large amount of work near Amasa, on the Menominee range, where it has several properties. A new shaft is down about 100 ft.; it has three compartments, and will go to considerable depth on the underlay of the ore body. Connection will be made at depth with the old Oliver Company shaft, and sinking will be continued to a distance much deeper than the Oliver Company went, in order to test the formation, which is very wide there. This is the old Gibson property, from which there were hopes of great things at one time. The Oliver Company's Michigan mine is idle, and will probably remain so for a while longer, as its ore is not of a character that can be used just now. The old Hemlock, also at Amasa, will get out this year about 100,000 tons; it is now down to 1000 ft., and the mine is looking better and more persistent at that depth than it has looked for a long time. A mile north of this property is a new exploration that gives good promise, and a small machinery plant has been placed there recently in order to test the ground deeper. About 5 miles from Amasa Pickands, Mather & Co. are working with two drills, and the understanding is that the results are very encouraging. The Whitesides exploration in the vicinity promises to be important.

The Breitung interests, of Marquette, are preparing to re-explore the old Washington mine tunnel at Humboldt, from which a considerable tonnage of good ore was taken in the early years. This tunnel is about 300 ft. long, and the timbers are so rotted that new will be required the entire length; it is said that ore exists in quantity along its course and that mining can begin as soon as the adit is ready for men. If warranted these people will place a drill on surface to thoroughly explore surrounding ground. They are now reopening the old Humboldt mine, buildings are going up and machinery is installed. The old workings must be unwatered and this job is to begin in a few days. It is not expected to take long. Some of the ore that has been in stock for some time will be shipped this fall.

D. E. W.

PERSONAL

James E. Moyer has resigned as superintendent of the blast furnace of M. A. Hanna & Co., at Canal Dover, Ohio, and has been succeeded by P. R. Conlin of Detroit.

We are officially advised that the press reports that John A. Topping would retire from the presidency of the Republic Iron & Steel Company are without foundation.

John Mitchell, president of the United Mine Workers of America, has announced that he will retire from that position on account of poor health.

E. W. Pargny, first vice-president of the American Sheet & Tin Plate Company, Pittsburgh, has gone to Idaho on a hunting trip.

Geo. G. McMurtry, New York, is named among members of the Iron and Steel Institute in attendance at the Vienna meeting in September.

Joseph Fawell, president of Mackintosh, Hemphill & Co., Pittsburgh, recently met with a serious accident while automobiling, sustaining a fractured skull and ruptured ear drums. He is now making rapid progress toward recovery, and strong hopes are entertained that his hearing will not be seriously impaired.

David H. Thomas, who has been general superintendent of the Thomas Iron Company, Hokendauqua, Pa., since March 1, 1893, has resigned for the purpose of engaging in another line of business. Samuel R. Thomas, his brother, has been appointed to succeed him as superintendent of the company's Ironton Railroad. A successor to fill the position of general superintendent has not yet been appointed, as it is the intention of the company for the present to divide the duties of this position between the division managers.

R. B. Carr, San Francisco, sales manager of the United Steel Company, which now has its office on the ninth floor of the Crocker Building, has returned home from an extended Eastern trip.

I. B. Williams, sales manager of the American Sheet & Tin Plate Company in San Francisco, is making an Eastern trip on business connected with the company.

Dr. J. A. Holmes, who is in charge of the United States Geological Survey work of testing fuels and structural materials, has recently spent some time in San Francisco investigating the reconstruction work in respect to the materials employed and the methods followed in providing greater security against earthquakes.

Peter Donaldson of James Watson & Co., iron merchants of Glasgow, Scotland, is expected to arrive in this country at an early date.

OBITUARY.

JAMES B. WILKES, a well-known iron manufacturer in the Shenango Valley, died at Sharon, Pa., October 8, aged 73 years. He was president and general manager of the Wilkes Rolling Mill Company, Sharon, manufacturer of muck bar and iron and steel sheets. He was born in Tredegar, Monmouthshire, England, grew to manhood in his native town and worked in the iron mills there, coming to America in 1861, when he was 28 years old. In September, 1863, he located in Sharon, and found employment in the Westerman iron mills. Mr. Wilkes was one of a company of 30 who erected an iron mill at Canal Dover, Ohio, in 1865-1866, and was interested in that mill till 1874, when it was sold to other parties. In 1891 he built the Wilkes rolling mill, and it has prospered under his careful management.

C. ADOLPHE LOW, interested in a number of coal and iron companies, died at his residence in New York, October 15, aged 79 years. He was a director in the Davis Creek Coal & Coke Company, the Chateaugay Ore & Iron Company, the Chateaugay & Lake Placid Railroad Company and the Sheffield Company. He was a member of the New York Chamber of Commerce and of many social and scientific organizations, comprising the New York Zoological, the New England and the New York Botanical societies, the Metropolitan Museum of Art, the American Museum of Natural History and the Metropolitan, Union League, Riding and Downtown clubs.

Toronto's Inducements to Manufacturers.

Toronto, Canada, is actively in the field in the endeavor to enlarge its manufacturing interests. One of the most interesting recent developments in the campaign to secure more factories is a booklet, entitled "Toronto, Favored Field for Factories," which has been issued by the Department of Industries and Publicity, of which Joseph E. Thompson is commissioner. The work comprises 56 pages, profusely illustrated and accompanied by a map showing the location of the city and the exceptional advantages it enjoys in transportation interests. The contents of the book have been divided into chapters, each of which takes up some special point in the city's development, and shows strikingly not only how the municipality has grown in that respect, but also how glowing are the prospects for expansion.

While much attention is given to the facilities enjoyed for commerce by water, as well as the numerous railroad connections with other portions of Canada and the United States, the advantages of the position of the city with respect to the enjoyment of cheap electrical power from Niagara Falls and its proximity to rich mineral deposits of various kinds are not overlooked. An interesting fact in this connection is the remarkably low cost of manufactured gas, which is only 75 cents per 1000 cu. ft. The statement can well be made that in no other city on the continent of America is this manufactured fuel and illuminant sold at a lower price. Under the gas company's charter the price falls automatically with a specified ratio of accumulated earnings, and thus the gradual reductions which have been provided for have brought the price down to this remarkably low figure. The booklet is not wholly devoted to material interests, but gives much attention to the city's educational facilities, including technical institutions.

The Melting Points of the Iron Group.

The August issue of the Bulletin of the Bureau of Standards of the Department of Commerce and Labor contains an article by G. K. Burgess on "The Melting Points of the Iron Group Elements by a New Radiation Method." The method is described, the results reached being the following:

Approximate Melting Point of the Iron Group.

Metal.	Melting point.	
	Degrees C.	Purity.
Iron	1,505	99.95
Chromium	1,489	98.99
Cobalt	1,464	99.95
Nickel	1,435	99.95
Manganese	1,207	98.99

Of these, the cobalt and nickel melting points appear to be correct to within 5 degrees, while the uncertainty of the iron, chromium and manganese points is probably less than 10 degrees C. It is not probable that any of these metals combines with platinum, or alloys with it, until the metal is melted at its natural melting point. The fresh melts are all white, changing to the color characteristic of each metal after standing in the air.

It is not claimed that the above numerical values are final, and they are given mainly as an illustration of the possibilities of a method which may be the only one available in certain cases. The above values are, however, in excellent agreement with certain of the latest determinations by the thermoelectric method, notably Harker's determination of the nickel point, and the determinations of Tammann and his associates for iron, nickel, cobalt and manganese when these latter results are reduced by extrapolation from the gold point and account is taken of the difference between the thermoelectric and optical scales.

The Board of Public Grounds and Buildings of the State of Pennsylvania has awarded the contract for the bridge over the Susquehanna River at Jersey Shore to the York Bridge Company, York, Pa., for \$54,945, and for the Nescopee bridge in Sugar Loaf township, Luzerne County, to the Penn Bridge Company, Beaver Falls, for \$8389.

By-Product Coke Ovens at Joliet.

The Steel Corporation Introduces the Koppers System.

Reference was made in these columns some months ago to the visit to Europe of a committee of engineers from the United States Steel Corporation's staff to study various systems of by-product coke ovens. One result of that investigation is the decision to adopt the Koppers system of retort ovens on a scale that will permit of its thorough trying out with the coals of the United States. At the Joliet, Ill., works of the Illinois Steel Company, four blocks of 70 ovens are now under construction. Foundation work has been completed and it is expected that half the plant, or two batteries, will be started in operation in the spring of 1908. West Virginia coal will be used for the most part, but it is the plan to experiment also with Indiana and Illinois coals, with a view to accomplishing eventually what has long been sought without success—their use in considerable percentages in by-product ovens.

The exhaustive investigations made in Europe and in this country by the Steel Corporation experts and the experience secured by two of the subsidiary companies in the operation of by-product ovens make it quite probable that the Koppers oven will be adopted for the Gary, Ind., plant. However, no definite step will be taken in the plans for the Gary by-product plant until experience at Joliet has been sufficient to answer all questions as to the availability of the Indiana and Illinois coals. Joliet was chosen as the location of the new plant largely because of its distance from the present coke supply and consequently the greater economies possible from by-product saving there. Another advantage considered was the compactness of the Joliet furnace plant, which consists of four stacks. In addition was the fact that the Joliet works were represented on the European Committee and that the new plant would therefore be in charge of an enthusiastic advocate of the Koppers system.

The Koppers by-product oven came to the attention of the United States Steel Corporation through a trip of one of its engineers through Germany last year in the investigation of gas engine installations. He found a battery of a new by-product oven in operation at one of the collieries of the Prussian Government. The Koppers latest type of regenerator oven was employed at this plant, and the design and operation were made the subject of a special report to the president of the Steel Corporation. The European trip of a committee of the Steel Corporation followed. A number of installations in England, Belgium and Germany were inspected and a large amount of data gathered. This committee consisted of W. Crawford of the National Tube Company, chairman; C. A. Meissner, secretary; Messrs. Brassert and McDonald of the Carnegie Steel Company, and D. R. Mathias, general superintendent of the Joliet works, Illinois Steel Company.

One of the features of the Koppers oven which particularly commended itself to the investigators was the better flame control in the oven and the good distribution of the heating. There was thus available a large amount of gas for purposes other than supporting combustion in the ovens. The accessibility of all parts of the construction for inspection was another consideration. It is stated also that the yield of coke and of by-products is very satisfactory. The plant to be erected at Joliet will embody the latest type of Koppers regenerator construction, with separate regenerators for each oven. The inventor, Heinrich Koppers of Essen Ruhr, Germany, is expected in the United States to supervise construction work at Joliet and will probably establish offices in this country. The oven was introduced about five years ago and meantime 2500 ovens have either been built or are in course of construction in Europe. The system has commended itself particularly to collieries seeking to provide gas engine power for their operations. In England about 500 ovens are now under construction.

Standards for Tool Steel.

The London *Times Engineering Supplement* says, relative to methods of measuring the value of tool steel: "A correspondent calls our attention to the recent decision of the American Society of Mechanical Engineers that the best measure for the value of a tool lies in the exact cutting speed in which it will be completely ruined at the end of 20 min. Shorter runs, it is said, give erratic results, while longer runs use up in each experiment so much of the forging that it is impossible to make enough experiments in cutting metal of uniform quality to get conclusive results. One of the most deceptive and untrustworthy standards for comparing the relative value of tools is the length of time a tool will run before requiring grinding or before being ruined. For example, three tools have been proved to be uniform within, say 2 per cent. by the 20 minutes' standard steel test, and to have a standard speed of 60 ft. per minute for a run of 20 min. If the cutting speed of these tools is increased to 63 ft. per minute the length of time at which they will run at this slight increase in cutting speed will be sure to vary greatly. One of the tools may be ruined in 6 min., another in 9 min., while the third may last 15 min. By an exhaustive series of experiments it has been proved that the value of tools can be accurately gauged by standard cutting speeds, but that it is in no sense proportional to the time which the tool runs before being ruined."

Combining on Blast Furnace Gas Power.

Commenting on a paper presented by B. H. Thwaite at the Vienna meeting of the Iron and Steel Institute last month, dealing with the economic distribution of electric power from blast furnaces, the London *Times Engineering Supplement* says:

"The proposals made by the author, though not new, are such as are likely to receive some support from practical men to-day in view of the increased efficiency of the large gas engine combined with the facilities for transmitting power economically. In the last 15 years the unit power of gas engines has increased from 300-hp. to 3000hp., while the thermal efficiency likewise is considerably better. He suggested that groups of iron smelters in a district could usefully combine for the purpose of discharging the waste gases from their furnaces into a common source, by which large gas engines coupled to electric generators could be driven, and this plan formed the basis of an act of Parliament last year applying to an area of some 400 square miles, including many furnaces belonging to separate firms. One difficulty expected in such a system would be the cost of the mains, for, the gas being of low calorific value, the pipes would necessarily be very large unless the gas was compressed, an expedient which would not be commercially feasible."

The Buffalo Tube Company, Buffalo, N. Y., recently incorporated for the manufacture of brass and copper tubes, has purchased a building site, 100 x 120 ft., on Rano street, and has optioned another piece of property adjoining its site, with a frontage of 100 ft., so that it can have room for expansion. The site borders on the Delaware, Lackawanna & Western Railroad, and is conveniently located for getting raw material at a minimum cost, being not far from the copper smelting plant at Black Rock and within a few hundred yards of the Buffalo Copper & Brass Rolling Mill now in course of construction. At first the company will manufacture copper and brass tubes for automobiles and marine engines, but later will make all sizes of tubing.

Probably the longest straight line of track of any railroad on the continent will be found on the National Transcontinental in northern Ontario, Canada. It covers a stretch of 70 miles, and will be built without a curve, rock cutting or any obstruction except rivers.

NEWS OF THE WORKS.

Iron and Steel.

The fire which destroyed the building of the rolling mill plant of the Falls Hollow Staybolt Company, Cuyahoga Falls, Ohio, about the middle of last month, did very little damage to the machinery and mill, and the plant is now running to full capacity. The company desires to thank its patrons for the patience exercised by the enforced delays in filling orders.

General Machinery.

The George A. Hogg Iron & Steel Foundry Company, Pittsburgh, manufacturer of chilled rolls and rolling mill machinery, is making shipments against the following contracts: Seventy-two-in. squaring shear for the Phillips Sheet & Tin Plate Company, Clarksburg, W. Va.; two No. 4 alligator shears, Vandyck-Churchill Company, New York; one 16-in. roll lathe, Valley Forge & Iron Company, Philadelphia, Pa.; one No. 4 motor driven alligator shear, Calumet Steel Company, Chicago Heights, Ill.; special machinery, Bergman Mfg. Company, Millvale, Pa., and a No. 3 alligator shear, A. Abelson & Co., Altoona, Pa.

The Greenwood Construction & Supply Company has been organized at Pittsburgh and has purchased the business of M. Greenwood & Sons, dealers in ice and refrigerating machinery. The new company is prepared to do a refrigerating engineering business, and as selling agents for the York Mfg. Company, York, Pa., will carry a full line of ammonia fittings and supplies in its storerooms at 318 Liberty avenue, Pittsburgh, where offices are also maintained. It will also handle a line of standard steam and power pumping machinery, air compressors and gas engines. The company is just completing the installation of a 20-ton York ice and refrigerating machine at the Columbia Hospital, Wilkensburg, Pa., and has lately installed and placed in operation a 10-ton York machine in the Nixon restaurant, Pittsburgh.

None of the bids for installing a crane in the addition to the pumping station at Nashville, Tenn., have been accepted, because the manufacturers who were asked to submit bids would not guarantee the practicability of operating a crane with a single-phase motor. The Board of Public Works will readvertise for bids for furnishing a crane equipped with a double-phase motor. The estimated cost of the crane and motor is about \$3500.

The Superintendent of School Buildings, Department of Education, New York, will receive bids until October 21 for installing heat and ventilating and electric generating apparatus and an electric elevator in the Parental School at Flushing, Borough of Queens.

The Missouri, Kansas & Texas Railroad contemplates the erection of extensive additions to its shops at Smithville, Texas, but nothing definite has been decided upon.

The Lewis Foundry & Machine Company, Groveton, Pa., builder of iron and steel works machinery, and maker of even depth chilled rolls, is erecting a new two-story building, 40 x 60 ft., with concrete base and of brick construction. The first floor will contain offices and the second floor drafting rooms, &c. Equipment consisting of an electric driven Gould pump and a 50,000-gal. water tank to supply the works is also being added. The company is also building an 8-in. train, consisting of one stand of pinion housings and five stands of rolls, motor driven, for the Midvale Steel Company, Philadelphia, and an 8-in. mill of the same type, engine driven, for the Fort Wayne Iron & Steel Company, Fort Wayne, Ind.

The Thomas Carlin's Sons Company, Allegheny, Pa., manufacturer of hoisting engines, derricks, contractors' tools, supplies, &c., is making a shipment of two 6-ft. grinding mills, of special designs, to be used in copper and gold mining work in Canada. The company is busy in its various departments and reports that it has orders calling for 32-lever shears, for shipment to various parts of the country, which aggregate about 460 tons in weight.

The Jefferson machine shops and foundry, James Z. May, proprietor, have been purchased by the Quinn Wire & Iron Works, Scranton, Iowa. The machinery equipment of the former plant will be transferred to the Quinn Wire & Iron Works plant at Scranton, which will add to its various products the manufacture of cement block making machines.

The Pilling Air Engine Company, Detroit, Mich., manufacturer of pneumatic hoists, locomotive turntable motors and compressed air hoisting machinery, will change its name to the Detroit Hoist & Machine Company, a new corporation with a paid in capital stock of \$50,000. The Pilling Air Engine Company will remain in existence with a nominal capital to protect the name and good will. Both companies will be under the same management. The company has recently installed and is now operating its new plant, improvements to which will be made in the near future, provision for which having been made by the purchasing of 3 acres of ground on the Grand Trunk Railroad at Milwaukee Junction. The site is considered one of the most advantageous points in Detroit.

The Soule Steam Feed Works, Meridian, Miss., is erecting a new machine shop, two stories, 50 x 150 ft., of mill construc-

tion. The old machine shop will be turned into a warehouse for finished machinery. The company has recently filled contracts for eight power simplex edge lumber stackers and conveyors, said to be one of the largest contracts of the kind yet executed in the country, and nine steam operated transfers for use in the plant of the Great Southern Lumber Company, Bogalusa, La.

Power Plant Equipment.

The Clay City Lighting Company, Clay City, Ind., has been incorporated, with a capital stock of \$10,000, to build a light and power plant at that place. Most of the machinery and equipment has already been purchased. B. M. Guirl is president and treasurer.

The Northern Engineering Works, Detroit, Mich., builder of electrical cranes and hoists, is adding a power station to its plant. The boiler and cold storage portion of this improvement, 30 x 60 ft., one story, fireproof construction with reinforced cement roof, will be built at once. Wickes boilers equipped with Murphy stokers and Webster heaters will be installed, contracts for which have been let.

The United Railways & Electric Company, Baltimore, Md., has not yet prepared plans for rebuilding its power plant, which was recently destroyed by fire.

The American Locomotive Company, Schenectady, N. Y., is to build a large power house at its Brooks Works at Dunkirk, the equipment for which has been purchased.

The Keller Steam Economizer Company, Joplin, Mo., is to spend about \$45,000 in the erection and equipment of its new plant, 65 x 100 ft., for the manufacture of Keller feed water heaters.

The New York, New Haven & Hartford Railroad, New Haven, Conn., is to make some changes in its machinery equipment in the Danielson power house, otherwise known as Dyer Dam, to consist of the substitution of 11,000 volt 25-cycle three-phase equipment for the 11,000-volt 60-cycle three-phase equipment now in use, the substitution being made for the purpose of operating the power house in parallel with the 25-cycle power in its Norwich power house, some miles distant.

The Town Council of Blacknell, Ind., is asking bids for the construction of a combined electric light and water system.

The Canton Boiler & Engineering Company has been awarded the contract for installing two boilers in the Stark County Infirmary at Canton, Ohio, and for two boilers for the Children's Fairmount Home, near Canton.

A. J. Smith, Dothan, Ala., intends to organize a company to erect a 3000-hp. hydraulic plant.

Foundries.

A new addition now being erected by the Menefee Foundry Company, Fort Wayne, Ind., is nearing completion. The new building is 66 x 214 ft., the walls being of concrete blocks and the roof of saw tooth construction. It is being equipped with Tabor molding machines for both light and medium work, and trolley tracks are being laid to the various floors for the handling of heavy ladles. The brass department will be equipped with a new fuel oil furnace, and the cupola, blower, elevator and air compressor will be electrically driven by direct connected motors.

The Oostburg Steel Foundry, Oostburg, Wis., maker of crucible steel castings, is installing in its plant electric light equipment for its own use.

Bridges and Buildings.

The Commissioners of Carbon County, Pa., have awarded contract for a steel bridge near Mauch Chunk to the York Bridge Company, York, Pa.

Paxton & Vierling Iron Works, Omaha, Neb., contemplates extensive improvements to its plant, which are designed to practically double its capacity. This work, however, will not be begun until some time next year.

The American Bridge Company, Pittsburgh, has received a contract from the Pittsburgh & Lake Erie Railroad for a two-track bridge over Chartiers Creek at McKees Rocks, to cost \$30,000.

The Midland Bridge Company, Kansas City, Mo., has purchased property in Rosedale, where it intends later to build a bridge shop of moderate capacity. The company intends to put up a storehouse for its foundation and erecting plant as soon as a switch can be built on the property, but the time for beginning the construction of the bridge shop will depend upon the condition of business about the first of the year.

The Dominion Bridge Company, Montreal, Canada, will increase its capital stock from \$1,000,000 to \$1,500,000, to provide for expansion of its business. New shops are being erected in Toronto and Winnipeg, and extensive additions are being built to the plant at Lachine.

Fires.

The main building of the chair factory of Smith, Day & Co., Baldwinville, Mass., was burned October 10, with loss of \$50,000.

The machine shops at Oroville, Cal., owned by W. P. Ham-

mon, were burned October 3, the loss being about \$25,000. The plant is known as the Boston Machine Shops.

The plant of the Goshen Iron Company, Goshen, Va., was damaged \$10,000 by fire October 3.

The plant of the American Hoist & Derrick Company, St. Paul, Minn., was damaged \$7000 by fire October 11.

The mills of the Du Font Powder Company at Fontanet, Ind., were destroyed by an explosion October 15.

The plant of the International Harvester Company at Minneapolis, Minn., was damaged \$75,000 by fire October 11.

Hardware.

The stockholders of the Spellacy-Raiff Enameling Company, Coshocton, Ohio, at a recent meeting decided to increase the company's capital stock from \$60,000 to \$90,000. The company's business has grown rapidly during the past year, and the capacity of the plant is at present inadequate.

The Elmira Machine Works, Elmira, N. Y., has recently established its own woodworking plant, and is now able to supply the wood parts for its electrical goods, carpenters' boring machines, scrapers, display racks, &c.

The Deming Company, Barberton, Ohio, which has been organized to manufacture a new mowing machine, has elected the following officers: Henry Deming, president and manager; C. S. Johnson, vice-president; C. J. Alpeter, treasurer, and H. A. Snyder, secretary. The erection of a plant will soon be commenced.

The J. S. Austin Company has been incorporated at Racine, Wis., with a capital stock of \$10,000. The company has perfected its organization with the election of the following officers: J. S. Austin, president; A. B. Austin, vice-president, and F. B. Austin, secretary and treasurer, the last named of whom will have the active management of the business. The company is organized to manufacture double acting floor spring hinges and light hardware specialties, and has purchased the business, good will and patents of the Sig. H. Novelty Works, an unincorporated concern that has been manufacturing hinges in a small way for the past two years. The new company will extend the business and gradually work in a general line of builders' hardware. Floor hinges will be the particular line of manufacture for the present, although the company is equipping itself to manufacture push plates, sash locks and drawer pulls.

The Slaymaker Lock Mfg. Company is asking a charter to manufacture locks and light hardware at Lancaster, Pa. The men interested are Harry C. Slaymaker, Horace E. Kennedy and Samuel R. Slaymaker, all of Lancaster.

The Butler Company, Butler, Ind., manufacturer of windmills and vehicles, on account of the increased demand for its goods has found it necessary to enlarge its plant, especially the foundry department. Improvements will be completed this month, after which the company will be able to fill orders for all kinds of small and medium gray castings. Orders for the company's regular products can be promptly filled at all times.

The Weissell Nut Lock Company, 1621 First National Bank Building, Chicago, has been recently incorporated under the laws of South Dakota, with a capital of \$100,000, to manufacture a patent nut lock. The officers of the company are J. A. Hemsteger, president; Eliot Fulton, vice-president; E. A. Hemsteger, treasurer.

The Wheeling Flexible Ladder Company has been organized at Wheeling, W. Va., with a capital of \$100,000, to manufacture flexible iron ladders and fire escapes.

The Farmers' Handy Wagon Company, Saginaw, Mich., advises that it has just completed a very successful season's run of silos, and although its capacity was increased the plant had to be run night and day for many months to fill orders.

Miscellaneous.

The Continental Motor Mfg. Company, Muskegon, Mich., maker of automobile and marine motor equipments, has increased its capital stock from \$125,000 to \$225,000. This action was taken in order to provide money required to handle its increasing business. Within the past year the capacity of the plant has been increased by the addition of a new testing plant which will soon be completed and ready for operation.

The Pittsburgh Automatic Vise & Tool Company, Pittsburgh, has received a large order for vises of the double and single swivel type, to be installed in the new shops of the Washington Terminal Railroad at Washington, D. C.

The Badger Meter Mfg. Company, Milwaukee, Wis., has increased its capital stock from \$15,000 to \$25,000.

The Moline Pump Company, Moline, Ill., has taken up the manufacture of a new dry cell for batteries, which it is putting on the market under the name of the Moline Long Life Dry Cell. The cell is said to be one of the best on the market, and the company reports orders coming in faster than it can take care of them.

The reconstruction of the buildings of the Eagle White Lead Company, Cincinnati, Ohio, which were recently destroyed by fire, will not be made under the supervision of J. C. Lemon, as reported, but they will be rebuilt under the direction of W. H. Forsinger, engineer in charge. The corroding houses, which will

be rebuilt of heavy oak timbers with oak sides and gravel roof, will be of modern construction for the purposes they are designed.

W. C. Stoddard has been appointed receiver for the North Penn Iron Works, Philadelphia, Pa. The company has a number of Government contracts, and an effort will be made to compromise with the creditors and continue the plant in operation.

In an item printed in these columns in a recent issue it was stated that the Moran Bros. Company, Seattle, Wash., intended to move its shipbuilding plant to Everett, where options have been taken on land. This was erroneous in that the plant has been operated since April 1 by the Moran Company, an entirely separate organization from the Moran Bros. Company. All the members of the latter company have retired from active business, and it remains in existence at this time only for the purpose of winding up its business.

The Canton Drop Forge & Mfg. Company, Canton, Ohio, has bought a tract of land, 70 x 125 ft., adjoining its present plant, and will at once fit it up for storage and general yard purposes. Later on the company will erect an extension to its present building which will cover part of this ground, but does not expect to do anything with this addition before the first of the year at least.

The Quick Unloading Car Chute Company, Watts Building, Birmingham, Ala., has incorporated to manufacture a chute for unloading railroad cars with a greater facility than the present methods, the invention of J. E. Brazeal, who is president and general manager. The company has selected a site upon which it will build the early part of next year, it having contracts with a shop at Birmingham and one in Chattanooga to supply the chutes at present. In addition to J. E. Brazeal, those interested in the company are B. M. Brazeal, who is secretary and treasurer; Fred M. Jackson and H. E. McCormack.

The Rossendale-Reddaway Belting & Hose Company, Newark, N. J., will rebuild the part of its plant which was recently destroyed by fire as soon as the insurance is adjusted. Orders have been placed for the machinery that was destroyed, and the company hopes to have the department that was damaged in operation again in about six or eight weeks.

The recent fire at the plant of the Battle Island Paper Company, Fulton, N. Y., did but little damage, and the company is now making the necessary repairs with the intention of having them finished in about two weeks.

The Panama Tank Company, New Orleans, La., is catering particularly to purchasers of cisterns and tanks in Mexico and the countries of South America. To further its interests in this direction, P. L. Tippet, manager, recently undertook a journey to the Republic of Mexico, to intelligently understand the situation and ascertain the wants of the trade. On his trip Mr. Tippet booked orders for tanks for storage of alcohol amounting to \$27,000.

In the recent reference in these columns to the Brunk Machine & Forging Company, Lorain, Ohio, an error was made in stating that it was connected with the Lorain Machine & Forge Company and the Welsh Automatic Boiler Company. The company, which has lately increased its capital stock from \$25,000 to \$35,000, is in no way connected with these latter companies.

A device for smoke consumption on locomotives, designed under the direction of T. F. Butler, master mechanic of the Pennsylvania Lines, was recently tested on the Belt Railroad at Indianapolis, under the eye of city officials and railroad men from various systems. The device is an arrangement of the grate that forces the smoke from the green coal to pass over the live coal, assisted by a forced draft, by blower, with an opening in the door of the firebox and by steam jets in the firebox. The locomotive had behind it 68 freight cars, part of them loaded. About two-thirds of the smoke ordinarily emitted from the stack was eliminated. The city officials said the device would be approved as meeting the requirements of the ordinance for the suppression of smoke within city limits.

The Carnegie Steel Company is installing a three-high 43-in. blooming mill in its Bessemer plant at the Ohio Works, Youngstown, Ohio, to replace a smaller mill, which is being torn out. Another blooming mill is being installed in this plant to rough down the ingots to be made in the new 12 50-ton open hearth furnaces now being built. Other additions now under way at these works include two blast furnaces to have a daily capacity of 600 tons each. It is also probable that a small billet mill will be added in the near future, but this has not been fully decided.

The Iron and Metal Trades

The week under review has been the duller thus far this year. New business is coming out with a good deal of hesitation, and generally speaking in moderate lots only, for fairly prompt delivery. Under conditions like those now prevailing it is practically impossible to gauge future consumptive requirements, but the disposition is to underrate them. Some consumers do not cover the raw material required for the finished products sold by them for future delivery, in fact, sell their own goods on the basis of cost figured on materials at prices which they hope to secure when the time for buying comes.

We are witnessing the extraordinary spectacle of Iron and Steel manufacturing plants operating at the highest speed ever attained in this country, proving an unprecedented consumption, and a widespread pessimism as to the future requirements, which is unparalleled and, we believe, unjustified. It does not follow that because orders have fallen off 25 or 30 per cent., more or less, consumption has undergone such a check.

So far as the Pig Iron industry is concerned, the first effects of the decline from the inflated prices are developing in the Eastern territory, where some furnaces are blowing out.

The stiff maintenance of nominal prices in other sections constitutes the real danger to the market, because it involves the chance of a very sharp decline when metal must be sold or piled up. As yet no accumulations have taken place except in isolated instances. Even taking into account that the supply of foreign Iron has been stopped, representing a corresponding adjustment to a lessened consumption, it is clear that we are not to melt enough Iron to keep all the furnaces running.

Very little new Steel Rail business has been done, either for the home market or for export. Steel Billets are weaker and are offered in the Pittsburgh District at \$28 for forward delivery. New contracts for Structural Steel are rather scarce and small. Among those closed during the week were 1800 tons for the Erie bridge across the Hackensack River and 1700 tons for an armory in the Bronx.

The Plate trade is quiet, while in the Sheet trade concessions are beginning to appear both on Black and Galvanized Sheets. The Tin Plate makers are cutting down production, the Greer and Shenango works of the leading interest being closed down. While Steel Bars continue firm, Iron Bars are easier in some of the markets.

The price of Copper has declined below 13c. for Electrolytic, but a little more interest is being shown by buyers, frightened though they be. The feeling is growing that the cutting in two of the price in less than six months must be bringing the metal to a level where consumers can afford to buy on a scale down. It must be taken into consideration that the restriction of output does not tell until three months have elapsed. It requires one month for the converter bars to reach the Eastern refineries from the Rocky Mountain mines and two months for the Copper to appear in the market. Still the financing of an accumulation of about 250,000,000 lb. of Copper is a burden which threatens the market for the metal.

Some curious reports come from abroad in regard to a sale of 700 to 800 tons of Corrugated Sheets for delivery to the Panama Canal through a Southern firm of merchants. It raises again the question whether foreign material should be employed in the construction of the canal.

A Comparison of Prices.

Advances Over the Previous Month in Heavy Type,
Declines in Italics.

At date, one week, one month and one year previous.

	Oct. 16, 1907.	Oct. 9, 1907.	Sept. 18, 1907.	Oct. 17, 1906.
PIG IRON, Per Gross Ton:				
Foundry No. 2, Standard, Philadelphia.....	\$20.00	\$20.00	\$20.50	\$21.00
Foundry No. 2, Southern, Cincinnati.....	21.25	21.25	21.25	20.00
Foundry No. 2, Local, Chicago.....	22.00	22.50	23.50	21.50
Bessemer, Pittsburgh.....	22.90	22.90	22.90	20.35
Gray Forge, Pittsburgh.....	20.40	20.40	20.90	19.35
Lake Superior Charcoal, Chicago.....	26.00	26.50	27.00	21.00
BILLETS, &c., Per Gross Ton:				
Bessemer Billets, Pittsburgh.....	28.00	28.50	29.50	28.00
Forging Billets, Pittsburgh.....	31.00	31.00	32.00	34.00
Open Hearth Billets, Phila.....	31.00	31.00	31.00	33.00
Wire Rods, Pittsburgh.....	35.00	36.00	36.00	34.50
Steel Rails, Heavy, Eastern Mill.....	28.00	28.00	28.00	28.00
OLD MATERIAL, Per Gross Ton:				
Steel Rails, Melting, Chicago.....	16.75	17.00	17.00	18.00
Steel Rails, Melting, Phila.....	16.25	16.25	16.75	18.50
Iron Rails, Chicago.....	20.25	20.25	20.25	26.00
Iron Rails, Philadelphia.....	20.50	20.50	20.50	25.00
Car Wheels, Chicago.....	24.50	24.50	24.50	19.25
Car Wheels, Philadelphia.....	22.75	23.00	23.00	20.75
Heavy Steel Scrap, Pittsburgh.....	17.25	17.25	17.00	16.75
Heavy Steel Scrap, Chicago.....	15.00	15.00	14.75	16.50
Heavy Steel Scrap, Philadelphia.....	16.00	16.00	16.50	18.00

FINISHED IRON AND STEEL,

Per Pound:	Cents.	Cents.	Cents.	Cents.
Refined Iron Bars, Philadelphia.....	1.75	1.75	1.80	1.83½
Common Iron Bars, Chicago.....	1.78	1.78	1.78	1.71½
Common Iron Bars, Pittsburgh.....	1.70	1.70	1.70	1.60
Steel Bars, Tidewater, New York.....	1.81	1.81	1.86	1.64½
Steel Bars, Pittsburgh.....	1.60	1.60	1.60	1.50
Tank Plates, Tidewater, New York.....	1.86	1.86	1.86	1.74½
Tank Plates, Pittsburgh.....	1.70	1.70	1.70	1.60
Beams, Tidewater, New York.....	1.86	1.86	1.86	1.84½
Beams, Pittsburgh.....	1.70	1.70	1.70	1.70
Angles, Tidewater, New York.....	1.86	1.86	1.86	1.84½
Angles, Pittsburgh.....	1.70	1.70	1.70	1.70
Skelp, Grooved Steel, Pittsburgh.....	1.85	1.85	1.85	1.57½
Skelp, Sheared Steel, Pittsburgh.....	1.95	1.95	1.95	1.60

SHEETS, NAILS AND WIRE,

Per Pound:	Cents.	Cents.	Cents.	Cents.
Sheets, No. 27, Pittsburgh.....	2.50	2.50	2.50	2.40
Wire Nails, Pittsburgh.....	2.05	2.05	2.05	1.85
Cut Nails, Pittsburgh.....	2.05	2.10	2.15	1.90
Barb Wire, Galv., Pittsburgh.....	2.50	2.50	2.50	2.30

METALS, Per Pound:

	Cents.	Cents.	Cents.	Cents.
Lake Copper, New York.....	13.25	14.00	15.50	22.00
Electrolytic Copper, New York.....	12.87½	13.62½	15.12½	22.00
Spelter, New York.....	5.55	5.40	5.00	6.25
Spelter, St. Louis.....	5.35	5.40	4.85	6.12½
Lead, New York.....	4.65	4.65	4.75	5.95
Lead, St. Louis.....	4.50	4.50	4.67½	5.90
Tin, New York.....	31.20	33.00	37.62½	43.40
Antimony, Hallett, New York.....	11.00	10.25	10.00	24.75
Nickel, New York.....	45.00	45.00	45.00	45.00
Tin Plate, 100 lb., New York.....	\$4.09	\$4.09	\$4.09	\$3.09

Chicago.

FISHER BUILDING, October 16, 1907.—(By Telegraph.)

No week of this year has been more quiet and inactive than that just closed. A review of market transactions discloses nothing that can be construed as indicative of renewed interest, or that portends any immediate relief from the incubus of money stringency which is conceded to be the chief obstacle in the way of industrial progress. Rails are neglected, though nothing of special importance is expected to develop in advance of the settlement of rolling specifications now pending. Billets are easier, base sizes of Forging Billets having declined about \$2 a ton. A very little demand for them has developed in this market, and it is believed that the wants of principal consumers are well covered by contracts against which they are specifying. Wire goods continue to lead all other finished products in strength and activity. In their movement is evident the sound position of the agricultural communities in which the demand has been but little weakened by the disturbing influences affecting other industrial interests. Wire Nails and Fencing Wire, though coming forward as fast as the mills can turn them out, are being steadily absorbed. Unsupported by a firm demand from any quarter, Scrap Material is weak with a steady trend toward lower price levels. Specifications in some lines are beginning to lag, but in the main there is no pronounced reaction in this respect. Neither Black nor Galvanized Sheets are as firm as they were. Independent mills in quest of orders have made concessions of \$1 a ton on the former and as much as \$2 on the latter from current prices. Pig Iron remains listless and inactive.

That the foundry melt has been sharply reduced there can be no question. Consumers seem wholly indifferent as to deliveries extending beyond the present quarter, and indeed are buying but sparingly for nearby requirements. Malleable Bessemer is exceptionally quiet.

Pig Iron.—It is doubtful if the aggregate tonnage booked in this market for the past two weeks will exceed 5000 tons, and some operators would place the figure under, rather than over, this mark. Sales in every case represent immediate wants. This, of course, means that only lots of small tonnage are being taken, trade, in fact, being practically restricted to car lot purchases, and even these are not overplentiful. Contract Iron coming forward seems to be about equal to melters' requirements. Northern furnaces especially are pretty well sold up for the remainder of the year and have no more open tonnage than in the ordinary course of business should be taken care of by current orders. At the present rate of buying, however, it is likely there will be more tonnage to dispose in this way than was anticipated. This, moreover, is being added to by the postponement of deliveries, that in some cases are being asked by melters, who, on account of lessened output and money stringency, are seeking such accommodations. Up to the present time the accumulations in furnace yards is relatively small. Altogether these interests are not at all apprehensive respecting the situation between now and the first of the year. What will develop beyond that time is purely speculative. There is an inquiry in the market for 5000 tons covering first half delivery, but considering the respective views as to price now entertained by producer and consumer, the chances of its being placed at present seem remote. Generally speaking, there is no disposition on either side to take up the question of contracts for the future until the actual needs for this period develop. While conditions are admittedly not conducive to market firmness, no sharp recessions have occurred, though Northern Foundry No. 2 is slightly easier and is about 50c. off from last week's quotations. Notwithstanding rumors of lower prices on Southern Iron no sales below \$18 to \$18.50, Birmingham, are reported for this year's delivery. Possibly the sale of small lots of resale Iron may have furnished the basis for the rumors noted. The following prices are for October, November and December delivery, f.o.b. Chicago:

Lake Superior Charcoal.....	\$26.00 to \$28.50
Northern Coke Foundry, No. 1.....	22.50 to 23.00
Northern Coke Foundry, No. 2.....	22.00 to 22.50
Northern Coke Foundry, No. 3.....	21.50 to 22.00
Northern Scotch, No. 1.....	23.50 to 24.00
Ohio Strong Softeners, No. 1.....	23.00 to 23.50
Ohio Strong Softeners, No. 2.....	22.50 to 23.00
Southern Coke, No. 1.....	22.85 to 23.35
Southern Coke, No. 2.....	22.35 to 22.85
Southern Coke, No. 3.....	21.85 to 22.35
Southern Coke, No. 4.....	21.35 to 21.85
Southern Coke, No. 1 Soft.....	22.85 to 23.35
Southern Coke, No. 2 Soft.....	22.35 to 22.85
Southern Gray Forge.....	20.35 to 20.85
Southern Mottled.....	20.35 to 20.85
Malleable Bessemer.....	22.50 to 23.00
Standard Bessemer.....	23.90 to 24.40
Jackson Co. and Kentucky Silvery, 6 %	30.40 to 30.90
Jackson Co. and Kentucky Silvery, 8 %	32.40 to 32.90
Jackson Co. and Kentucky Silvery, 10 %	34.40 to 34.90

(By Mail.)

Billets and Rods.—Only a few car lot sales of Forging Billets are reported for the week. No inquiries for any considerable tonnage are heard of, and prices are easier. Local mills have no great surplus and are not pressing sales, but offers from some outside mills indicate a desire to secure orders. We quote Forging Billets at \$33 to \$35, Chicago. Wire Rods are fairly firm at \$35 to \$37, Pittsburgh.

Rails and Track Supplies.—The past week has developed nothing new in the way of Rail purchases. Track Supplies are quiet, though the demand for Spikes shows a slight improvement over the last few weeks. Prices are fairly firm at current quotations for small orders, but might possibly be shaded on an inquiry for large tonnage. We quote as follows: Angle Bars, accompanying Rail orders, 1907 delivery, 1.65c.; car lots, 1.75c. to 1.85c.; Spikes, 2c. to 2.10c., according to delivery; Track Bolts, 2.50c. to 2.60c., base, Square Nuts, and 2.65c. to 2.75c., base, Hexagon Nuts. The store prices on Track Supplies range from 0.15c. to 0.20c. above mill prices. Light Rails, 30 to 45 lb. sections, \$34; 25-lb., \$35; 20-lb., \$36; 16-lb., \$37; 12-lb., \$38, f.o.b. mill. Standard Sections, \$28, f.o.b. mill, full freight to destination.

Structural Material.—Business continues quiet. Plenty of plans for prospective work, some of which involve good tonnages of Structural Shapes, keep coming in, but there are no actual closures of anything but contracts of minor importance. Several large Structural enterprises on the Pacific Coast are waiting for more favorable conditions of the money market. Restraint from the same cause is felt here. Contracts were placed during the week with the South Halstead Street Iron Works, Chicago, for about 1000 tons for the construction of the new Southern Hotel and Palace Theater buildings. Specifications in fairly good volume are coming to the mills, but new business is quiet. Prices from store are quoted without change, at 2.05c. to 2.10c., and mill prices at Chicago are as follows: Beams and Channels, 3 to 15 in., inclusive, 1.88c.; Angles, 3 to 6 in., 1/4-in. and

heavier, 1.88c.; larger than 6 in. on one or both legs, 1.98c.; Beams, larger than 15 in., 1.98c.; Zees, 3 in. and over, 1.88c.; Tees, 3 in. and over, 1.93c., in addition to the usual extras.

Plates.—The mills of the Illinois Steel Company are busy on specifications against contracts, and are well provided with orders for the rest of the year. Shipments, however, far exceed the tonnage supplied by new business. Buyers of Sheared Plates are getting fair deliveries from some outside mills on desirable specifications, though the demand is light. Prices continue firm. We quote for future delivery as follows: Tank Plates, 1/4-in. and heavier, wider than 6 1/4 and up to 100 in. wide, inclusive, car lots, Chicago, 1.88c. to 2.08c.; 3-16 in., 1.98c. to 2.18c.; Nos. 7 and 8 gauge, 2.03c. to 2.23c.; No. 9, 2.13c. to 2.33c.; Flange quality, in widths up to 100 in., 1.98c. to 2.08c., base, for 1/4-in. and heavier, with the same advance for lighter weights; Sketch Plates, Tank quality, 1.98c. to 2.18c.; Flange quality, 2.08c. Store prices on Plates are as follows: Tank Plates, 1/4-in. and heavier, up to 72 in. wide, 2.20c. to 2.30c.; from 72 to 96 in. wide, 2.30c. to 2.40c.; 3-16 in. up to 60 in. wide, 2.30c. to 2.40c.; 72 in. wide, 2.50c. to 2.65c.; No. 8, up to 60 in. wide, 2.35c. to 2.45c.; Flange and Head quality, 0.25c. extra.

Sheets.—Shipments on old orders continue heavy, but only a moderate amount of new business is being booked. Some of the independent mills are now well caught up and are seeking new orders, with the result that some irregularity in prices has developed. Concessions of \$1 a ton on Black and \$2 a ton on Galvanized are reported to have been made in some instances. Store prices are also easier, prices on Blue Annealed having declined \$2 a ton and Galvanized \$1. We quote mill shipments as follows, Chicago: Blue Annealed, No. 10, 2.03c.; No. 12, 2.08c.; No. 14, 2.13c.; No. 16, 2.23c.; Box Annealed, Nos. 17 to 21, 2.53c.; Nos. 22 to 24, 2.58c.; Nos. 25 to 26, 2.63c.; No. 27, 2.68c.; No. 28, 2.78c.; No. 29, 2.88c.; No. 30, 2.98c.; Galvanized Sheets, Nos. 10 to 14, 2.83c.; Nos. 15 and 16, 3.03c.; Nos. 17 to 21, 3.18c.; Nos. 22 to 24, 3.33c.; Nos. 25 and 26, 3.53c.; No. 27, 3.73c.; No. 28, 3.93c.; No. 30, 4.43c. Sheets from store: Blue Annealed, No. 10, 2.30c.; No. 12, 2.35c.; No. 14, 2.40c.; No. 16, 2.50c.; Box Annealed, Nos. 18 to 21, 2.70c.; Nos. 22 to 24, 2.75c.; No. 26, 2.80c.; No. 27, 2.85c.; No. 28, 2.95c.; No. 30, 3.35c.; Galvanized from store: Nos. 10 to 20, 3.15c. to 3.25c.; Nos. 22 to 24, 3.50c. to 3.55c.; No. 26, 3.60c. to 3.65c.; No. 27, 3.80c. to 3.95c.; No. 28, 4.10c.; No. 30, 4.60c. to 4.65c.

Bars.—New business is confined to scattered orders of small tonnage. An unhesitating supply of specifications against contracts continues to be the feature in this department. Business in Bar Iron is only fair, but so far orders are sufficient to keep rolling schedules well supplied. Quotations, Chicago, are as follows: Steel Bars, 1.78c., with half extras; Iron Bars, 1.78c.; Hoops, 2.18c., extras as per Hoop card; Bands, 1.78c., as per Bar card, half extras; Soft Steel Angles and Shapes, 1.88c., half extras. Store prices are as follows: Bar Iron, 2.10c. to 2.25c.; Steel Bars, 2c. to 2.10c.; Steel Bands, 2c., as per Bar card, half extras; Soft Steel Hoops, 2.35c. to 2.45c., full extras.

Merchant Pipe.—The demand holds up well and, though new orders no longer exceed the mill output, the volume of business being booked is considerable. Jobbers' stocks are still relied upon for prompt requirements, from which they can generally be quickly furnished. The following mill discounts are quoted: Black Pipe, 1/4 to 6 in., 71.2; 7 to 12 in., 68.2; Galvanized, 1/4 to 6 in., 61.2. These discounts are subject to 1 point on the base. From store in small lots Chicago jobbers quote 68 per cent. on Black Steel Pipe, 1/4 to 6 in. About 4 points advance above these prices is asked for Iron Pipe.

Boiler Tubes.—There is practically no contract or forward delivery buying, the demand being for prompt requirements. Boilermakers' orders include only small lots for immediate wants. Mill quotations for future delivery on the base sizes are as follows: 2 1/2 to 5 in., in carload lots, Steel Tubes, 63.2; Iron, 50.2; Seamless, 49.2; 2 1/2 in. and smaller, and lengths over 18 ft., and 2 1/2 in. and larger, and lengths over 22 ft., 10 per cent. extra. Store prices are as follows:

	Steel.	Iron.	Seamless.
1 to 1 1/4 in.....	35	35	35
1 1/4 to 2 1/4 in.....	50	35	35
2 1/4 in.....	52 1/2	35	35
2 1/2 to 5 in.....	60	47 1/2	47 1/2
6 in. and larger.....	80	85	..

Merchant Steel.—The extreme discounts on Shafting recently named by a leading interest have been withdrawn, and as a result the irregularity that for a while characterized the market has disappeared. The quotation referred to was made on a basis of Pittsburgh delivery, instead of base territory delivery, which for the time being caused some confusion. Quotations on Shafting are herewith revised and fairly represent the market, which is now practically uniform and firm. New business in Merchant Steel is light, but specifications are satisfactory. Quotations are as follows: Planished or Smooth Finished Tire Steel, 1.98c.; Iron Finish up to 1 1/2 x 1 1/2 in., 1.93c.; Iron Finish, 1 1/2 x 1 1/2 in. and

larger, 1.78c., base; Channels for solid Rubber Tires, $\frac{3}{4}$ to 1 in., 2.28c., and $1\frac{1}{8}$ in. and larger, 2.18c.; Smooth Finished Machinery Steel, 2.18c.; Flat Sleigh Shoe, 1.93c.; Concave and Convex Sleigh Shoe, 2.08c.; Cutter Shoe, 2.46 $\frac{1}{2}$ c.; Toe Calk Steel, 2.33c.; Railroad Spring, 1.98c.; Crucible Tool Steel, $7\frac{1}{4}$ c. to 8c., and still higher prices are asked on special grades. Shafting, 54 per cent. off in car lots; 48 per cent., less than car lots, base territory delivery.

Cast Iron Pipe.—In common with other products closely allied to the Pig Iron interests, Cast Iron Pipe is not strongly in demand, especially in large quantities and for extended delivery. Buyers are waiting for better prices, which they seem to feel sure will in the near future prevail. A letting this week by the city of Ashland, Ohio, for about 500 tons of Water Pipe constitutes the only transaction in sight. Small orders for repairs and replacements furnish the bulk of the business, which is relatively light. We quote, per net ton, Chicago, as follows: Water Pipe, 4-in., \$37; 6 to 12 in., \$36; 16-in. and up, \$35, with \$1 extra for Gas Pipe.

Coke.—Interest centers in the accumulation of stocks to provide for the anticipated delays that a little later are expected to result from shortage of cars. Shipments against contracts are therefore being urged. Only a fair demand for immediate needs is noted. We quote 72-hr. Connellsville Foundry Coke at \$3.25 to \$3.50, at oven.

Old Material.—A few items in the list exhibit a good deal of firmness, but as a whole the market is weak. Trading is light, and if any of the large consumers are anticipating heavy purchases they give no intimation of it. Rerollers are in demand, but buyers balk at the high prices asked, and only lots required for immediate needs are moving. The Illinois Central, it is said, rejected all bids on its list of 10,500 tons offered last week, and will hold the material for a future market. It is likely, however, that some of this tonnage will be disposed of at private sale. Railroad lists for this week include a total of 11,700 tons, of which the Baltimore & Ohio is offering 7700 tons and the Northern Pacific 4000 tons. But little material from the former list is expected to reach this market. We quote, per gross ton, f.o.b. Chicago, as follows:

Old Iron Rails.....	\$20.25 to \$20.75
Old Steel Rails, rerolled.....	17.25 to 17.75
Old Steel Rails, less than 3 ft.....	16.25 to 17.75
Relaying Rails, standard sections, subject to inspection.....	26.00 to 28.00
Old Car Wheels.....	24.50 to 25.00
Heavy Melting Steel Scrap.....	15.00 to 15.50
Frogs, Switches and Guards, cut apart.....	15.50 to 16.00
Mixed Steel.....	11.00 to 11.50

The following quotations are per net ton:

Iron Fish Plates.....	\$17.00 to \$17.50
Iron Car Axles.....	23.50 to 24.00
Steel Car Axles.....	20.00 to 20.50
No. 1 Railroad Wrought.....	14.75 to 15.25
No. 2 Railroad Wrought.....	13.75 to 14.25
Railway Springs.....	14.00 to 14.50
Locomotive Tires, smooth.....	17.50 to 18.00
No. 1 Dealers' Forge.....	12.00 to 12.50
Mixed Bushing.....	10.50 to 11.00
Iron Axle Turnings.....	10.50 to 11.00
Soft Steel Axle Turnings.....	10.50 to 11.00
Machine Shop Turnings.....	10.50 to 11.00
Cast Borings.....	8.50 to 9.00
Mixed Borings, &c.....	8.50 to 9.00
No. 1 Mill.....	9.00 to 9.50
No. 2 Mill.....	8.00 to 8.50
No. 1 Boilers, cut to Sheets and Rings.....	10.50 to 11.00
No. 1 Cast Scrap.....	16.50 to 17.00
Stove Plate and Light Cast Scrap.....	14.00 to 14.50
Railroad Malleable.....	15.50 to 16.00
Agricultural Malleable.....	14.25 to 14.75
Pipes and Flues.....	11.00 to 11.50

Metals.—Some further recession is noted in Copper, while Spelter shows a slight advance. An inquiry for 1,000,000 lb. of Copper is reported in this market, but inasmuch as deliveries covering a period of two years were stipulated it elicited no offers. There is a somewhat improved demand for small lots for actual wants, and a few orders of moderate size are being placed for future delivery. On the whole, however, buyers show a disposition to await further developments. We quote as follows: Casting Copper, 15c.; Lake, 15 $\frac{1}{2}$ c. to 16c., in car lots for prompt shipment; small lots, $\frac{1}{4}$ c. to $\frac{3}{4}$ c. higher; Pig Tin, car lots, 35 $\frac{1}{4}$ c.; small lots, 35 $\frac{1}{2}$ c.; Lead, Desilverized, 5c. to 5.10c., for 50-ton lots; Corroding, 6c. to 6.10c., for 50-ton lots; in car lots, 2 $\frac{1}{4}$ c. per 100 lb. higher; Spelter, 5.65c.; Cookson's Antimony, 13 $\frac{1}{2}$ c., and other grades, 12 $\frac{1}{4}$ c. to 13c.; Sheet Zinc is \$7.50 list, f.o.b. La Salle, in car lots of 600-lb. casks. On Old Metals we quote: Copper Wire, 14 $\frac{1}{2}$ c.; Heavy Copper, 14c.; Copper Bottoms, 13c.; Copper Clips, 13c.; Red Brass, 13c.; Yellow Brass, 11c.; Light Brass, 8c.; Lead Pipe, 5c.; Zinc, 4 $\frac{1}{2}$ c.; Pewter, No. 1, 28c.; Tin Foil, 30c.; Block Tin Pipe, 32c.

The Bethlehem Steel Company, South Bethlehem, Pa., has opened a Cleveland office and warehouse at 1264-1268 Ontario street, in charge of R. A. Hamaker. The Cleveland branch will make a specialty of handling high grade steels, and will carry a complete stock of Bethlehem special high speed and other tool steels.

Pittsburgh.

PARK BUILDING, October 16, 1907.—(By Telegraph.)

Pig Iron.—There has been some little inquiry for Basic and Malleable Bessemer in small lots for November and December delivery, and Basic has been sold on the base of about \$19.50, Valley furnace, or \$20.40, Pittsburgh. There is nothing doing in Bessemer, the nominal price being \$22, Valley furnace. No Bessemer is being offered on the market, nor is there any inquiry. It is pretty well assured that the price of Bessemer for delivery next year will be somewhat lower than it is now. There have been no sales of Bessemer for next year, but something in this direction may be done in November or early in December with some of the larger consumers. Foundry Iron is quiet, and Northern No. 2 for forward delivery is quoted at \$19.50 to \$20, Valley furnace, while several furnaces are able to sell carload lots for spot shipment as high as \$21.25, at furnace. Northern Forge Iron is held nominally at \$19.50, Valley furnace, or \$20.40, Pittsburgh, but there have been some resales by consumers at lower prices.

Steel.—Further weakness has appeared in prices of Steel Billets, and there is very little inquiry. We quote Bessemer 4 x 4 in. Billets at \$28 to \$28.50, and Open Hearth about \$30, Pittsburgh. It is possible that on a large tonnage and for extended delivery Open Hearth Billets could be bought at about \$29.50, Pittsburgh. Forging Billets are quoted at about \$31, Pittsburgh, but this price could be shaded on contracts for large tonnage. Sheet and Tin Bars are still held at \$31, maker's mill.

(By Mail.)

Half a dozen or more consumers of Malleable Bessemer and Basic Iron that have been holding off from buying on account of the declining market have come in recently with inquiries aggregating 15,000 tons or more, and about 8000 tons has been sold, mostly Basic, for deliveries commencing this month and running into December. These are the first legitimate inquiries that have come in the market for two months or more, and are construed by some producers of Pig Iron to mean that the long expected buying movement has possibly started. It is understood that the price was from \$19.50 to \$19.75, at Valley furnace. There is nothing doing in Bessemer Iron, but consumers who have contracts are urging the furnaces for shipments and are taking the Iron as fast as it can be shipped. The nominal price of Bessemer is \$22, Valley furnace, and there is practically none being offered. There is absolutely nothing doing in Foundry or Forge Iron and the market is weak. The Steel market also is weaker, Bessemer Billets being offered for forward delivery as low as \$28 and Open Hearth at \$30 or less, f.o.b. Pittsburgh. The new tonnage being placed in Finished Iron and Steel continues light and will not show much betterment until the money market improves. The railroads claim that prices for material and rates of interest for money are both so high as to prohibit their placing contracts. The mills report that specifications against old contracts are coming in fairly well and shipments continue heavy, but are not as large as they were some time ago. The market on Coke and Scrap is fairly steady.

Ferromanganese.—The market continues dull, and prices have further gone off, a sale of about 50 tons of foreign 80 per cent. Ferro, this year delivery, having been made last week on the basis of \$55, Pittsburgh. We quote foreign 80 per cent. Ferro at \$53, Baltimore, or \$54.92, Pittsburgh, for delivery in the next quarter.

Muck Bar.—We are not advised of any new business having been placed for some little time. Prices are weak, owing to the sharp decline in Forge Iron, and we quote best grades of Muck Bar, made from all Pig Iron, at \$35, Pittsburgh. On a firm offer this price might be shaded.

Skelp.—The mills are pretty well filled on old contracts, specifications on which are coming in quite freely, but new business is quiet. Prices are only fairly strong, and we quote: Grooved Steel Skelp, 1.85c. to 1.90c.; Sheared Steel Skelp, 1.95c. to 2c.; Grooved Iron Skelp, 2.15c. to 2.20c., and Sheared Iron Skelp, 2.25c. to 2.40c., depending on sizes and widths. All these prices are f.o.b. maker's mill.

Rods.—Nothing of interest has occurred. We quote Bessemer Rods at \$35 to \$36, and Open Hearth, \$36 to \$37, Pittsburgh.

Steel Rails.—The situation as to Standard Sections is in *statu quo*. The mills that are rerolling Rails are cutting the prices of the manufacturers of Light Rails \$2 a ton or more. Prices on Light Rails, which are being shaded about \$2 a ton by the mills rerolling Rails, are as follows:

\$33 to \$34 for 20 to 45 lb.; \$34 to \$35 for 16-lb., and \$35 to \$36 for 12-lb., at mill. Angle Splice Bars are held at 1.65c., and Standard Section Rails at \$28, at mill.

Plates.—A good deal of tonnage from car builders, boat builders and in municipal work is pending, but owing to the tight condition of the money market and also to the fact that consumers of Plates are looking for a reduction in prices, little new business is coming out. Leading consumers of Plates have been assured by the larger mills that there will not be any reduction in prices, but this assurance does not seem to have had the effect of causing them to place contracts. Prompt deliveries of Universal Plates can be had without trouble, but on Sheared Plates the mills are from two weeks to two months or longer behind in shipments. We quote: Tank Plates, $\frac{1}{4}$ -in. thick, $6\frac{1}{4}$ in. up to 100 in. wide, 1.70c., base, at mills, Pittsburgh. Extras over this price are as follows:

	Extra per 100 lb.
Gauges lighter than $\frac{1}{4}$ -in. to and including 3-16-in.	
Plates on thin edges.....	\$0.10
Gauges Nos. 7 and 8.....	.15
Gauge No. 9.....	.25
Plates over 100 to 110 in.....	.05
Plates over 110 to 115 in.....	.10
Plates over 115 to 120 in.....	.15
Plates over 120 to 125 in.....	.25
Plates over 125 to 130 in.....	.50
Plates over 130 in.....	1.00
All sketches (excepting straight taper Plates varying not more than 4 in. in width at ends, narrowest end being not less than 30 in.).....	.10
Complete Circles.....	.20
Boiler and Flange Steel Plates.....	.10
"A. B. M. A." and ordinary Firebox Steel Plates.....	.20
Still Bottom Steel.....	.30
Marine Steel.....	.40
Shell Grade of Steel is abandoned.	

TERMS.—Net cash 30 days. Pacific Coast base, 1.60c., f.o.b. Pittsburgh, with all rail tariff rate of freight to destination added, no reduction for rectangular shapes 14 in. wide down to 6 in. of Tank, Ship or Bridge quality.

Structural Material.—New Structural contracts are few in number, and are mostly for small jobs which aggregate only a fair tonnage. The railroads are holding back a large amount of work which they are not expected to place until the money market is easier. We quote: Beams and Channels, up to 15 in., 1.70c.; over 15 in., 1.80c.; Angles, 3 x 2 x $\frac{1}{4}$ in. thick, up to 6 x 6 in., 1.70c.; 8 x 8 and 7 x $3\frac{1}{2}$ in., 1.80c.; Zees, 3 in. and larger, 1.70c.; Tees, 3 in. and larger, 1.75c.; Bulb Angles and Deck Beams, 2c. Under the Steel Bar card, Angles, Channels and Tees under 3 in. are 1.70c., base, for Bessemer and Open Hearth, subject to half extras on the Standard Steel Bar card.

Sheets.—The volume of new business in Light Sheets is perhaps slightly better, but as a rule the trade is buying cautiously and only for absolute needs. The feeling is pretty general among consumers of Sheets, that unless trade conditions soon improve the prices of Sheets will be lower, and for this reason they are holding off placing orders, buying only such quantities as they absolutely need. Specifications on contracts are coming in only fairly well, some tonnage having been held up. Deliveries of Black Sheets can be had from some mills in two to three weeks, but most mills are unable to furnish Galvanized Sheets under four to six weeks or longer. There is some unevenness in prices on both Black and Galvanized Sheets, particularly the former. Prices, which are sometimes slightly shaded, are as follows: Blue Annealed Sheets, No. 10 gauge and heavier, 1.85c.; Nos. 11 and 12, 1.90c.; Nos. 13 and 14, 1.95c.; Nos. 15 and 16, 2.05c.; Box Annealed, Nos. 17 to 21, 2.35c.; Nos. 22 to 24, 2.40c.; Nos. 25 and 26, 2.45c.; No. 27, 2.50c.; No. 28, 2.60c.; No. 29, 2.75c.; No. 30, 2.85c. We quote Galvanized Sheets as follows: Nos. 10 and 11, 2.65c.; Nos. 12 and 14, 2.75c.; Nos. 15 and 16, 2.85c.; Nos. 17 to 21, 3c.; Nos. 22 and 24, 3.15c.; Nos. 25 and 26, 3.35c.; No. 27, 3.55c.; No. 28, 3.75c.; No. 29, 4c., and No. 30, 4.25c. We quote No. 2 gauge Painted Roofing Sheets at \$1.85 per square, and Galvanized Roofing Sheets, No. 28 gauge, \$3.25 per square, for 2-in. corrugations. These prices are for carload lots, jobbers charging the usual advances.

Tin Plate.—A fair amount of new tonnage by canners and other interests has been placed recently, but none of the Tin Plate mills is filled up for the balance of the year, all of them having spare producing capacity for December. Unless the demand soon shows material betterment, there will have to be a material restriction in output; in fact, some concerns have already taken the initiative in this, and have cut down their output considerably, taking advantage of the dullness to make needed repairs. The two largest plants of the leading interest, the Greer and Shenango works at New Castle, as well as some of its other plants, are idle. We quote \$3.90 for 100-lb. Cokes, 14 x 20, f.o.b. Pittsburgh, terms 30 days, less 2 per cent. off for cash in 10 days, on which price a rebate of 5c. a box is allowed for carload and larger lots.

Bars.—New orders in both Iron and Steel Bars are practically all for small lots and early delivery. None of the large consumers will contract ahead, believing that prices may possibly be lower. With the large tonnage in Steel Bars on the books of the mills, the Carnegie Steel Company

being filled for six months or more and Republic and Jones & Laughlin for a long period, it does not seem likely that prices of Steel Bars will be changed in the near future at least. We quote Steel Bars at 1.60c., base, Pittsburgh, and Iron Bars at 1.70c., Pittsburgh, for delivery in the Pittsburgh District, and 1.60c., Pittsburgh, for Western shipment.

Spelter.—The market is firmer than for some time, and prime grades of Western are held at 5.40c., St. Louis, equal to 5.52 $\frac{1}{2}$ c., Pittsburgh. It is said that prices of Spelter are being manipulated more or less by some of the leading Western smelters.

Merchant Steel.—Some of the leading makers of Shafting got together last week and arranged prices, these being on the basis of 54 per cent. off in carloads and 48 in less than carloads, delivered in base territory. The Shafting market is now referred to as being in better shape than for some time, the demand being fairly satisfactory, and it is believed the new prices will be maintained. A fair amount of new business is being placed in Merchant Steel, but it is mostly made up of small lots for prompt shipment, consumers not caring to contract ahead. Specifications against contracts are coming in fairly well. We quote Cold Rolled Shafting at 54 per cent. off in large lots and 48 per cent. off in carload lots, delivered in base territory; Smooth Finished Machinery Steel, 1.85c. to 2c., depending on quality; Flat Sleigh Shoe, 1.65c. to 1.75c.; Cutter Shoe, 2.15c. to 2.20c.; Toe Calk Steel, 2.10c. to 2.15c.; Railroad Spring Steel, 1.75c. to 1.80c.; Crucible Tool Steel, 6c. to 8c. for ordinary grades, and 10c. and upward for special grades.

Railroad Spikes.—Practically no new business is being placed in Railroad Spikes, but a local maker has secured a contract for 1500 kegs of Spikes of standard sizes for delivery to the Panama Canal. We quote standard sizes of Railroad Spikes at \$1.95 to \$2, and small sizes at \$2.10 to \$2.15 per 100 lb., f.o.b., Pittsburgh.

Merchant Pipe.—A fair amount of new tonnage is being placed in merchant sizes of Pipe, but the output is probably double the amount of new tonnage being placed, so that the mills are catching up at a pretty rapid rate on back shipments. However, the leading mills have enough on their books to carry them through this year at least. Prices on Steel Pipe are firm, but on Iron Pipe are inclined to weakness. It is not believed there will be any change in prices of Steel Pipe for this year, and what may be done in this direction after the new year opens will depend on conditions existing at that time. Discounts on Steel Pipe are as follows:

	Merchant Pipe.	
	Jobbers, carloads.	Steel.
	Black.	Galv.
$\frac{1}{8}$ to $\frac{1}{4}$ in.....	.65	49
$\frac{3}{8}$ in.....	.67	53
$\frac{1}{2}$ in.....	.69	57
$\frac{3}{4}$ to 6 in.....	.73	63
7 to 12 in.....	.70	55
Extra strong, plain ends:		
$\frac{1}{4}$ to $\frac{3}{8}$ in.....	.58	46
$\frac{1}{2}$ to 4 in.....	.65	53
$\frac{1}{2}$ to 8 in.....	.61	49
Double extra strong, plain ends:		
$\frac{1}{2}$ to 8 in.....	.54	43

To the large trade all above discounts are subject to 1 point on the base, and 5 per cent. on the net.

Official discounts on Iron Pipe, which are shaded 2 points or more to the large trade, are as follows, f.o.b. Pittsburgh:

	Standard Genuine Iron Pipe.	
	Black.	Galv.
	%	%
$\frac{3}{8}$ to 6 in.....	.67	57
$\frac{1}{2}$ in.....	.62	50
$\frac{3}{4}$ in.....	.60	42
$\frac{1}{2}$ and $\frac{1}{4}$ in.....	.58	42
7 to 12 in.....	.62	47

Extra Heavy Iron Pipe, Plain Ends.

	Black.	Galv.
	%	%
$\frac{1}{2}$, $\frac{3}{4}$ and $\frac{1}{2}$ in.....	.62	40
$\frac{1}{2}$ to 4 in.....	.59	47
$\frac{1}{2}$ to 8 in.....	.55	42

Boiler Tubes.—Only a fair amount of new tonnage in Railroad Tubes is being placed by the railroads, and we understand some of this is being taken at low prices. The demand for Merchant Tubes is fairly active and prices are reasonably firm. Discounts on Merchant Tubes are as follows:

	Boiler Tubes.	
	Iron.	Steel.
	%	%
1 to 1 $\frac{1}{4}$ in.....	.42	47
1 $\frac{1}{4}$ to 2 $\frac{1}{4}$ in.....	.42	59
2 $\frac{1}{4}$ in.....	.47	61
2 $\frac{3}{4}$ to 5 in.....	.52	65
6 to 13 in.....	.42	59
2 $\frac{1}{2}$ in. and smaller, over 18 ft. long, 10 per cent. net extra.		
2 $\frac{3}{4}$ in. and larger, over 22 ft. long, 10 per cent. net extra.		

Iron and Steel Scrap.—Prices offered on the Pennsylvania Railroad Scrap, for which bids were closed last week, are understood to have been an average of \$2 a ton lower than on the previous schedule. There is very limited buying of Scrap by consumers, who are placing orders only for such material as they absolutely need. The tendency of the mar-

ket is decidedly toward lower values. Dealers quote about as follows: Heavy Melting Steel Scrap for Pittsburgh, Sharon or Steubenville delivery, \$17.25 to \$17.50, but it is believed on a firm offer and for any considerable tonnage \$17 could be done. No. 1 Railroad Wrought Scrap is \$17 to \$17.25; Re-rolling Rails, \$17 to \$17.25; No. 2 Wrought Iron Scrap, \$16.75 to \$17; Bundled Sheet Scrap, \$14.50 to \$14.75; No. 1 Cast Scrap, \$19 to \$19.25; Cast Iron Borings, \$12.50 to \$12.75; No. 1 Busheling Scrap, \$15.75 to \$16; No. 2, \$12.25 to \$12.50; Low Phosphorus Melting Stock, \$21; Old Steel Rails, short pieces, for Open Hearth use, \$17 to \$17.25; Old Car Wheels, \$23.50; Steel Axles, \$20.50; Standard Sheet Bar Crop Ends, \$20; Stove Plate, \$14.50 to \$14.75; Grate Bars, \$14.75 to \$15. All above prices are per gross ton, f.o.b., Pittsburgh, unless otherwise stated.

Coke.—There is a fair demand for Furnace Coke, and best grades of Connellsville and other high grade makes are held at \$2.85 to \$2.90 a ton at oven. We note a sale of 50 cars of Connellsville Furnace Coke at \$2.85 at oven. Connellsville 72-hr. Foundry Coke is held at \$3.25 to \$3.40 a ton at oven. The output of Coke in the Upper and Lower Connellsville regions last week was 426,859 tons.

Philadelphia.

PHILADELPHIA, PA., October 15, 1907.

More buying in some grades of Pig Iron is reported, but the individual tonnages taken have in most cases been small. Finished material, as a rule, has not been in as good demand, and while there is no change in prices, there is little doubt that present figures could be shaded slightly if some desirable business came out. While the market for Pig Iron looks better on the surface, the undertone is hardly as strong. Some furnaces need tonnage, and if necessary will make concessions to get the business. Prices therefore are still hard to quote with accuracy, and, as stated some weeks ago, a buyer might have quotations from different producers for the same grade of Iron, the prices of which showed considerable variation, dependent entirely on how badly the seller needed tonnage for the remainder of the year. Consumers in some cases are not specifying deliveries on old contracts as satisfactorily as heretofore, and, while there is but little Iron on furnace yards, producers appear determined to keep stocks down as low as possible. Statistics regarding the production of Pig Iron in September have been noted with considerable interest. The fact that we have entered the month of October with a greater active capacity than was the case in September indicates a further increase in production, and it is evident that producers will have to make a sharp curtailment if production is not to show a further gain on consumption. That this will be done is unquestioned; in fact, one furnace in the Schuylkill Valley was put out last week, and another will go out as soon as materials for repairs can be assembled. Other stacks in this territory are expected to go out before many weeks. Some have been kept in blast much beyond the usual period, due particularly to the fact that contracts for high priced Iron had not yet been completed. Considerable time will elapse when repairs are begun before they are ready to be blown in again. There seems to be little inclination on the part of either buyer or seller to contract for next year's deliveries. There has been a little more inquiry, but both sides are pursuing a waiting policy, and it is expected that it will be several weeks before any great volume of business for 1908 is done.

Pig Iron.—Prices, while nominally unchanged, do not have quite as large a range as was the case some weeks ago, which might be taken to indicate that sellers are getting pretty close to what they call the bottom. It has been contended by some furnaces that at present prices they do not get a new dollar back for an old one, and that before taking further contracts at present figures they would blow out their furnaces. That producers are considering this seriously there is no doubt; in fact, an informal meeting of several furnacemen was held in this city last week, when matters of general interest were discussed, and the statement has since been made that furnaces would not be run at a loss. This subject will no doubt be fully discussed at the regular meeting of the Eastern Pig Iron Association, which will be held in this city Wednesday afternoon, and the outcome of its deliberations will be awaited with considerable interest. Buyers in many cases seem satisfied with the present level of prices, but still they are buying only from hand to mouth, taking their monthly needs rather than those for the full quarter, so as to be able to take advantage of any lower prices should they prevail. While practically all of the recent business has been confined to sales for delivery over the remainder of the year, there has been a little more inquiry for Iron for 1908, but neither buyer or seller appears anxious to make contracts at or about the present prices. Buyers are apparently willing to take the chance of still easier prices, while sellers hope that they will be able at least to hold the present level, and believe that should any marked buying movement set in prices would harden mate-

rially. A waiting market prevails, therefore, as far as Iron for next year's delivery is concerned. Sales of No. 2 X Foundry Iron have been confined almost entirely to small lots, ranging from single carloads up to those of 300 to 500 tons, with prices ranging from \$20 to \$20.50, delivered, but there is little doubt that if a firm offer was made for a good tonnage these figures would be shaded by some furnaces 25c. a ton. A sale of some 2000 tons of No. 2 X Foundry for pipe making is noted, while other sales aggregating 1800 tons of the same grade were made at \$19.50 to \$19.75, delivered. There has been more inquiry for Malleable Irons, some for delivery extending into next year, but no actual orders have been reported. A little more activity has developed in Forge Iron, a sale of one round lot being reported at about \$18.25, delivered, while several small lots were also taken at about \$17.75, but these were said to be not quite up to grade. There has not been a great deal doing in Basic Iron. Some fair sales are reported at close to \$18.50, delivered, but it is believed that this could be shaded a trifle on a firm offer for a good tonnage. Standard Low Phosphorus has been quiet, and prices are pretty well maintained, as there is not much of this grade around. About 2000 tons of misfit Low Phosphorus was recently sold at \$24 to \$25, delivered, dependent upon the analysis. The range of prices for delivery in buyers' yards, eastern Pennsylvania and adjoining territory, for the remainder of the year, would be about as follows:

No. 2 X Foundry.....	\$20.00 to \$20.50
Gray Forge.....	18.00 to 18.50
Basic.....	18.50 to 18.75
Low Phosphorus.....	27.00 to 27.50

Ferromanganese.—The demand has not been active and sales have been few and confined to small tonnages. Prices are unchanged, \$54 to \$55 being quoted for deliveries over the remainder of the year, while \$56 to \$57 is named for delivery in the first half of 1908.

Steel.—Sales are confined to small lots for immediate needs and mills are not very fully occupied. Specifications on old orders are not heavy, and while prices are nominally quoted at \$31 to \$32 for ordinary Rolling Steel and \$34.50 to \$35.50 for Forging Steel, they could no doubt be shaded if a desirable tonnage came out.

Plates.—The tonnage of new business is not heavy and mills are only fairly busy. Orders are coming in for small lots and cover only immediate needs of customers. While prices are unchanged, there is a strong probability that some of the mills would make slight concessions for a good tonnage of desirable business. Quotations are as follows:

	Carload. Cents.	Part carload. Cents.
Tank, Bridge and Boat Steel.....	1.85	1.90
Flange or Boiler Steel.....	1.95	2.05
Marine.....	2.20	2.25
Locomotive Firebox Steel.....	2.40	2.45
The above are base prices for ¼-in. and heavier. The following extras apply: Extra per 100 lb.		
3-16-in. thick.....	\$0.10	
Nos. 7 and 8, B. W. G.....	.15	
No. 9, B. W. G.....	.25	
Plates over 100 to 110 in.....	.05	
Plates over 110 to 115 in.....	.10	
Plates over 115 to 120 in.....	.15	
Plates over 120 to 125 in.....	.25	
Plates over 125 to 130 in.....	.50	
Plates over 130 in.....	1.00	

Structural Material.—There is a good volume of day to day business. No large tonnages have been taken, and the business is made up largely of miscellaneous lots. Mills are fairly busy, and as a rule pretty prompt delivery can be had. Prices are unchanged, being quoted at 1.85c. to 2c., according to specifications.

Bars.—There has been no improvement in the demand for Bars. Sales have been light. Mills are not very busy. Best Refined Iron Bars are quoted at 1.75c. to 1.80c., but prices are not strong. Steel Bars are quoted at 1.85c., but prompt deliveries are hard to get.

Old Material.—Continued weakness characterizes the market for Old Material. Buyers are taking small tonnages in most cases, and prices are not strong. Several round lots of No. 1 Steel Scrap have been sold at \$16, while several of the other specialties are quoted at lower prices. Bids and offers for deliveries in buyers' yards are quoted about as follows:

Old Steel Rails and Crops.....	16.25 to \$16.75
No. 1 Steel Scrap.....	16.00 to 16.50
Low Phosphorus.....	21.00 to 21.50
Old Steel Axles.....	20.00 to 20.50
Old Iron Axles.....	27.50 to 28.50
Old Iron Rails.....	20.50 to 21.00
Old Car Wheels.....	22.75 to 23.25
Choice No. 1 R. R. Wrought.....	17.50 to 18.00
Machinery Castings.....	18.00 to 18.50
Wrought Iron Pipe.....	14.50 to 15.00
No. 1 Forge Fire Scrap.....	13.25 to 13.75
No. 2 Light Iron.....	9.50 to 10.00
Wrought Turnings.....	12.75 to 13.25
Stove Plate.....	14.50 to 15.00
Cast Borings.....	11.50 to 12.00
Grate Bars.....	14.00 to 14.50
No. 2 Light Sheet Steel.....	12.00 to 12.50

Sheets.—While orders for Sheets are not individually

large, they aggregate a fair tonnage, and mills are pretty fully occupied. Most of the business is of a day to day character, while but little is being placed for forward delivery. Prices for mill shipments are as follows, a tenth extra being quoted for small lots: Nos. 18 to 20, 2.80c.; Nos. 22 to 24, 2.90c.; Nos. 25 to 26, 3c.; No. 27, 3.10c., and No. 28, 3.20c.

Cincinnati.

FIFTH AND MAIN STS., October 16, 1907.—(By Telegraph.)

Assuming that the presence of high officials and frequent excursions into the Iron producing fields of local sales agents betoken some sort of activity, it is, perhaps, permissible to predict an early awakening of trade in Pig Iron, but for the present and for the immediate future there is to be reported little change. Here and there are noted special features, but none of them in the main have any real bearing on the situation, and it is quite as difficult to-day as for the past few weeks to report the market intelligently. For instance, the surplus of low grade stocks that accumulated in the yards of the Southern furnaces has been pretty well cleaned by giving a buyer an extremely low price on a large tonnage of Gray Forge or No. 4 to be mixed with No. 2 at \$18. In this kind of combination Gray Forge has been moved as low as \$14 and \$14.25, Birmingham. The disquieting reports of financial embarrassments in connection with the business of certain furnaces in the Alabama District, and the cutting of prices by some of the smaller furnaces in both the Alabama and Virginia fields, have furnished material for gossip in lieu of business. While it is generally believed that \$17.50, and even \$17, may be done on No. 2 Southern for first quarter delivery, there seems prevalent a determination on the part of furnacemen to maintain the last quarter prices. It is generally conceded that little surplus Iron will be carried over, and that most of the big producers are well booked up for their capacity for the balance of 1907.

Pig Iron.—Transactions for the week have been small, but the price has been shaved a little and several small lots of Southern No. 2 have been sold for \$17.50 at furnace. This, however, is pretty generally rated as resale Iron. The quantity being limited, it would be insignificant in fixing a new market price. There are two furnaces in the Alabama and as many in the Virginia District reported as cutting the price to the \$17.50 basis, but the larger furnaces are reported as having a tentative agreement on the balance on the year. The attitude of a furnaceman in the Hanging Rock District, who, it is reported, has 14,000 tons piled in his yards, largely of high Silicons and the better grades, in holding his product on the basis of \$22.50 and \$23 for No. 2, is being widely commented on in this market. No. 2 Northern is held at \$20.50 at furnace, and some sales are reported as moving on special delivery at \$21. An inquiry for 4000 tons, divided equally between No. 2 Southern and No. 2 Soft from a melter reported to be in the Newcomerstown, Ohio, Pipe and Plumbers' Supplies field, is being negotiated as this is written. The Iron is for November and December delivery. The heaviest buyer in this line has just purchased a 300-ton lot of Southern No. 2 Soft at \$18 for immediate delivery. To sum up, therefore, while a few melters who needed Iron badly have succeeded in buying small lots at a figure below the basis maintained by the large furnaces, it is believed that the comparatively slender output in excess of contract Iron on the books of the companies will complete the present asked price for the balance of the year. For present delivery and the balance of 1907 we quote, f.o.b. Cincinnati, on which are figured the freight rates from Birmingham, \$3.25, and from the Hanging Rock District, \$1.20, as follows:

Southern Coke, No. 1.....	\$21.75 to \$22.25
Southern Coke, No. 2.....	21.25 to 21.75
Southern Coke, No. 3.....	20.75 to 21.25
Southern Coke, No. 4.....	19.25 to 19.75
Southern Coke, No. 1 Soft.....	21.75 to 22.25
Southern Coke, No. 2 Soft.....	21.25 to 21.75
Southern Coke, Gray Forge.....	18.75 to 19.25
Southern Coke, Mottled.....	18.25 to 18.75
Ohio Silvery, 8 per cent. Silicon.....	30.20 to 30.70
Lake Superior Coke, No. 1.....	22.70 to 23.20
Lake Superior Coke, No. 2.....	22.20 to 22.70
Lake Superior Coke, No. 3.....	21.70 to 22.20

Car Wheel Irons

Standard Southern Car Wheels.....	\$29.25 to \$29.75
Lake Superior Car Wheels.....	27.70 to 28.00

Coke.—The situation is a little easier, although spot Coke is difficult to buy. The labor situation, which has been serious, is not lessened. This, coupled with the increasing car shortage, is very annoying, although there is a good sized tonnage of both Foundry and Furnace grades on hand. Wise County and New River Furnace grades are quoted at \$3 to \$3.25, at oven; Foundry, \$3.25 to \$3.50, and firm; Connellsville Foundry, \$3 to \$3.50; Furnace, \$2.75 to \$3. Pocahontas is said to be practically off the market and no quotations are given out for this year's shipment. There is a little freer movement in the Connellsville product.

Finished Iron and Steel.—The increasing demand for practically all lines of finished material has not abated and local dealers are very optimistic on the conditions. A feature of local buying has been the demand for 2 and 3 ton

lots from store, and in some instances a very much larger tonnage, usually ordered from the mills, has been taken from store stocks. One instance wherein a consumer found himself short developed a 35-ton order from the middleman. A hand to mouth policy seems to be the feature of the finished material line. There is considerable activity in Iron Bars. Dealers quote, f.o.b. Cincinnati, as follows: Iron Bars, carload lots, 1.80c., with half extras; small lots from store, 1.90c., base, full extras; Steel Bars, carload lots, 1.75c., base, half extras; small lots from store, 1.90c., base, full extras; Base Angles, carload lots, 1.75c.; small lots from store, 2.10c.; Beams, Channels and Structural Angles, 1.85c., base; small lots from store, 2.10c.; Plates, 1/4-in. and heavier, carload lots, 1.95c.; small lots from store, 2.20c.; Sheets, No. 16, carload lots, 2.20c.; small lots from store, 2.50c.; No. 14, carload lots, 2.10c.; small lots from store, 2.40c.; Steel Tire, 4-in. or heavier, carload lots, 1.95c., base; Plates, 3-16 and No. 8, carload lots, 2c.; small lots from store, 2.25c.; Sheets, No. 10, 2c., carload lots, 2.30c. from store; Sheets, No. 12, 2.05c., carload lots, 2.40c. from store; Light Sheets, Black, No. 28, carload lots, 2.75c.; Galvanized, No. 28, 3.90c.

Old Material.—There is absolutely no interest in the Scrap market, and dealers are taking the opportunity to clean up their yards and make needed improvements. Prices show a tendency to further weakness, except that nominal quotations remain about the same. Dealers quote, f.o.b. Cincinnati, about as follows:

No. 1 R. R. Wrought, net ton.....	\$14.50 to \$15.00
Cast Borings, net ton.....	8.50 to 9.00
Steel Turnings, net ton.....	9.00 to 9.50
No. 1 Cast Scrap, net ton.....	15.50 to 16.00
Burnt Cast and Wrought, net ton.....	9.00 to 9.50
Old Iron Axles, net ton.....	22.50 to 23.50
Old Iron Rails, gross ton.....	19.00 to 19.50
Old Steel Rails, long, gross ton.....	16.00 to 17.00
Relaying Rails, 56 lb. and up, gross ton	27.00 to 27.50
Old Car Wheels, gross ton.....	22.00 to 22.50
Mining Car Wheels, gross ton.....	12.00 to 13.00
Low Phosphorus Scrap, gross ton.....	18.50 to 19.00

Cleveland.

CLEVELAND, OHIO, October 15, 1907.

Iron Ore.—Ore is moving in very satisfactory shape from the upper lake ports, and it is believed that the October shipments will fall but little below those of September. The weather so far this month has been fairly good on the Ore ranges, so that open pit operations have been interfered with very little by rains. As a result Ore has been coming forward from the mines freely and boats have not been seriously delayed in waiting for cargoes. The heavy Ore movement is keeping all the contract boats busy, and there is some demand for wild tonnage, but shippers have no trouble in finding all the tonnage they need. Lake rates for Ore remain stationary. As is usually the case in October, a great deal of Ore is being piled on the Lake Erie docks. Because of the increased storage facilities of many of the furnaces, it is believed that a smaller percentage of Ore will be placed on the docks this season than ever before. There is some delay in direct shipments to the furnaces because of car shortage. With average fall weather conditions from now till the close of navigation it is almost certain that the season's shipments will exceed 40,000,000 tons. There is little talk as yet regarding next year's Ore prices. The Ore market remains quiet and firm, with few inquiries, but with little Ore to be had. Prices are as follows at Lake Erie docks, per gross ton: Old Range Bessemer, \$5; Mesaba Bessemer, \$4.75; Old Range Non-Bessemer, \$4.25; Mesaba Non-Bessemer, \$4; Siliceous Bessemer, \$2.75; Siliceous Non-Bessemer, \$2.35 to \$2.60.

Pig Iron.—While the local Foundry Iron market remains quiet and little if any improvement is noted in the demand for spot Iron, there is a better demand for Iron on contracts. Foundries as a rule seem to be using more Iron than they were a few weeks ago. As a result, not only are requests that shipments be withheld scarce at present, but a number of melters are urging prompt shipments, and in some cases furnaces are asked to anticipate shipments. Sales have been limited to small lots of one or two carloads, but the demand is sufficient to take all the output not under contract, so that local furnaces are accumulating no Iron. Sales in small lots have been made by local furnaces at \$21 and \$21.50, at furnace, for No. 2 Foundry. A local interest reports 2000 tons of No. 2 Foundry Iron sold for early delivery at \$20 and \$20.60, at western Pennsylvania furnace, the sale being made in two lots. Malleable Iron is in good demand. A local interest received an inquiry this week for 1000 tons of Malleable and 1000 tons of Foundry for early delivery, but was unable to furnish the Iron. Corrigan, McKinney & Co., announce that their Josephine Furnace will be changed from Foundry to Bessemer Iron about November 1, and will turn out about 20,000 tons of Bessemer between that date and the close of the year. The Bessemer output has not yet been sold. There are no inquiries for Basic Iron, but consumers are urging prompt shipments on contracts. No change has developed in the

Foundry Iron situation for next year. Quite a few inquiries are coming in, but no furnace seems ready yet to set the pace, and quotations of \$21.50 for No. 2 Iron are given in response to inquiries. Many consumers will not use up the Iron they have coming under present contracts before February 1 or later. Because of the uncertainty as to next year's prices, one of the largest contracts for castings in this territory, for which there has been an inquiry in the market for several weeks, has not yet been closed. Quotations for the balance of 1907, f.o.b. Cleveland, are as follows:

Bessemer	\$22.90
Northern Foundry, No. 1.....	\$21.50 to 22.00
Northern Foundry, No. 2.....	21.00 to 21.50
Northern Foundry, No. 3.....	20.50 to 21.00
Gray Forge.....	20.40

Coke.—The market is firm, but consumers are well covered for the balance of the year. The demand on contracts continues strong. Furnace Coke for the balance of the year is scarce. Some contracts for Foundry Coke for the first half of next year were closed during the week. For delivery for the balance of the year we quote Furnace Coke at \$3 to \$3.15, at oven, and 72-hr. Connellsville Foundry Coke at \$3.25 to \$3.50, at oven.

Finished Iron and Steel.—Specifications are coming in in fairly good shape, some mills reporting a slight improvement in this regard, but the market remains very quiet as far as new business is concerned. Some mills have shown considerable activity in looking for orders the past week or two, and have picked up some new business in small lots. While there is a fair run of specifications, consumers, as a rule, are not anticipating their wants, but specifying only for immediate requirements. Prices in most lines of Finished Material are being held firm. The implement makers are sending in good specifications, and a local representative of an Eastern mill who visited five of the leading implement makers in this territory in the past few days received reports from them that their orders already on hand are from 40 to 50 per cent. larger than they were at this time last year. The demand for Steel Bars is good, and mills are not catching up further on deliveries, promising shipments in from four to six weeks. Iron Bars are weak and in light demand, and it is reported that the Pittsburgh basing price of 1.60c. might be shaded for a good sized tonnage. Local mills have received some fair orders for Iron Bars from Western railroads for car repair work. Prompt deliveries can be secured on Iron Bars. We quote Steel Bars at 1.70c., Cleveland, for car lots, with half extras, and Iron Bars at 1.65c., Cleveland. There are few inquiries for Plates, but a fair amount of specifications. We quote Plates 1/4-in. and heavier, carload lots, 1.80c., base, Cleveland. The Structural situation is quiet, the demand being confined to small lots. We quote Beams and Channels at 1.80c., base, Cleveland. The demand for Sheets is rather light. Jobbers at present have good sized stocks in Sheets on hand. There is a fairly good demand for Light Rails for mines. Mills report good specifications on Rolling Billets. We quote Forging Billets at \$34 to \$35, Cleveland, for prompt shipment. Warehouse business continues good, and while it is not as heavy as in the two previous months jobbers report a larger volume of business than in October of last year. Warehouse prices remain firm, although a little concession is reported on some outside business in Steel Bars to meet Western competition. We quote Steel Bars out of stock at 1.90c. to 1.95c., and Iron Bars at 1.95c. to 2c. Warehouse prices on Sheets are as follows: Blue Annealed, No. 10, 2.30c.; No. 28 One Pass Cold Rolled, 3.05c.; No. 28 Galvanized, 4.05c. Beams and Channels are 2.10c. to 2.15c., base, out of stock. Jobbers' price on Boiler Tubes, 2 1/4 to 5 in., is 64 per cent. discount, and on Black Merchant Iron Pipe, base sizes, 67 per cent. discount.

Old Material.—The market is weaker and prices on several grades of Scrap have declined in the past few days. The tendency is downward, and dealers are looking for still lower quotations. Local mills have their supply of Scrap pretty well used up and are urging prompt shipments on contracts, but are buying little, and that only for their immediate needs. Local dealers have been selling some Scrap to mills in the valley and other outside territory, but that demand is less than it was a short time ago. The Norfolk & Western Railroad has a list out of about 1200 tons of Scrap to be sold this week. Dealers' prices to the trade, per gross ton, f.o.b. Cleveland, are as follows:

Old Steel Rails.....	\$16.00 to \$16.25
Old Iron Rails.....	22.00 to 22.50
Steel Car Axles.....	21.50 to 22.00
Old Car Wheels.....	21.50 to 22.50
Relaying Rails, 50 lb. and over.....	27.50 to 28.00
Relaying Rails, under 50 lb.....	30.00 to 31.00
Heavy Melting Steel.....	15.50 to 16.00
Railroad Malleable.....	17.50 to 18.00
Agricultural Malleable.....	15.00
Light Bundled Sheet Scrap.....	13.50 to 14.00

The following quotations are per net ton, f.o.b. Cleveland:

Iron Car Axles.....	\$24.00 to \$25.00
Cast Borings.....	9.75 to 10.50
Iron and Steel Turnings and Drillings.....	10.50 to 11.00
Steel Axle Turnings.....	13.00 to 13.50
No. 1 Bushelling.....	14.00 to 15.00
No. 1 Railroad Wrought.....	15.50 to 16.00
No. 1 Cast.....	17.00 to 17.50
Stove Plate.....	14.00 to 14.50
Bundled Tin Scrap.....	10.00

Birmingham.

BIRMINGHAM, ALA., October 13, 1907.

Pig Iron.—Several new lots of resale Iron have been placed in the hands of brokers within the past few days, which shows better than probably could anything else what confidence the melters have in the market. This Iron is being offered at about \$1 per ton under furnace quotations. Lower grades continue to increase in furnace yards, and the price is decreasing in about the same proportion. On No. 2 Soft the leading producers continue to maintain their former quotation of \$18.50. Buying during the week has been confined to requirements for immediate consumption only. The Water Pipe manufacturers, who are the largest local consumers of Foundry Iron and on whom the furnaces have been depending to take a large percentage of their unsold product during this quarter, are curtailing their output, and many other foundries here are laying off a part of their forces, which will materially reduce consumption. On the other hand, production instead of decreasing in Alabama is really increasing. A movement is on foot to start one and possibly two of the furnaces in this district which have been idle for several years. The Tennessee Coal, Iron & Railroad Company has finished the repairs on the No. 1 Furnace at Ensley and it was blown in last week. The Sloss-Sheffield Steel & Iron Company's No. 4 Furnace at North Birmingham is nearing completion, and will be ready for blast within the next few weeks. If present expectations are realized the Alabama Consolidated Coal & Iron Company will have two additional stacks ready for the torch within the next 30 days. The furnace of the Williamson Iron Company was closed down last week for relining and repairs. No date for resumption is given. This is one of the smallest furnaces in the district, and is never operated except when Iron is bringing maximum prices.

Cast Iron Pipe.—Much disappointment is being felt among Southern manufacturers at not securing the Cuban contracts recently let. The high rate of freight is said to have been very much against them, the rate from Southern ports to Cuba being just five times as much as the rate from English ports. Some of the Water Pipe foundries here have begun to curtail their production and at the present time are making only such sizes as they have actual specifications for. They argue that with the country in its present unsettled condition they cannot afford to make and carry large stocks out of the present high priced Iron and labor. Small orders constitute a large percentage of the orders now being booked, but in the aggregate the tonnage is quite attractive, everything considered. Prices on Water Pipe are approximately as follows per net ton, f.o.b. cars here: 4 to 6 in., \$32; 8 to 12 in., \$31; over 12 in., average \$29, with \$1 per ton extra for Gas Pipe. On large municipal contracts these prices are probably slightly shaded.

Old Material.—The demand for Wrought Scrap continues good. The mills, however, are buying only for current consumption and refusing to make contracts for extended deliveries. Cast Scrap is somewhat more quiet, due doubtless to the fact that low grade Foundry Iron at its present price is as economical as Scrap. Dealers' quotations are about as follows per gross ton, f.o.b. cars in yards here:

Old Iron Rails.....	\$22.00 to \$22.50
Old Iron Axles.....	18.50 to 19.00
Old Steel Axles.....	17.00 to 17.50
Old Car Wheels.....	20.50 to 21.00
No. 1 Railroad Wrought.....	17.50 to 18.00
No. 2 Railroad Wrought.....	13.00 to 13.50
No. 1 Country Wrought.....	15.00 to 15.50
No. 2 Country Wrought.....	12.00 to 12.50
Wrought Pipes and Flues.....	13.00 to 13.50
Railroad Malleable.....	14.00 to 14.50
No. 1 Steel.....	14.00 to 14.50
No. 1 Machinery Cast.....	15.50 to 16.00
Stove Plate and Light Cast.....	12.00 to 12.50
Cast Borings.....	8.25 to 8.75

San Francisco.

SAN FRANCISCO, October 9, 1907.

Pig Iron.—The demand generally is fair, but as a rule is limited to requirements for the balance of the year. Some of the foundries and manufacturing plants have contracts ahead that have some time to run. Stocks in the hands of importers and dealers are running low, and but little is being shipped from European ports for the Pacific Coast, owing to advances in ocean freights. The last arrival of Pig Iron at this port was September 26, per ship Helene Blum, which brought only 700 tons of No. 1 Doncaster Pig and 150 tons of No. 1 Jarrow. Very little domestic Pig is brought in from the East. The following is about the range of prices, ex ship, San Francisco:

No. 1 English Foundry.....	\$29.00 to \$30.75
No. 1 Scotch Foundry.....	30.00 to 32.50

Structural Material.—Owing to the disposition of property owners to postpone the signing of construction contracts until after the municipal election, there are not many new orders for Structural Steel to report. According to some estimates, a total of \$10,000,000 worth of building construction work is held in abeyance until it is ascertained

what sort of a city government there is to be after January 1. Contractors are inclined to think many of the owners are too timid in this respect, but an increase of 25 per cent. in wages in the building trades, which would be possible, though not probable, if the president of the Building Trades Council, who is the Union Labor candidate for Mayor, is elected, would upset many calculations for construction. Good deliveries are being made on Structural Steel for several large buildings. The Steel framework of the 14-story Metropolis Bank Building has been finished and the stone facing is going up. The 10-story Steel frame of the Balboa Building has been completed. The 12-story skeleton Steel frame of the Head Building is up and the terra cotta walls have been started. The Steel for all of these structures was furnished by the American Bridge Company, which has just taken a contract to supply 1800 tons of Steel for the Rose Building, a fine modern structure. The largest contract for Steel which this company is filling in this city at present is one for 7050 tons for the new Palace Hotel. The grillages are being placed in position in the central portion of the great structure. For the Phelan Building 6200 tons of Steel were ordered through the same company. All of the footings are in place and the erection of the Structural Steel has just been commenced. Thirty Steel contracts for San Francisco buildings have been taken by this company since the fire, and all other companies combined have contracted to supply Steel for about an equal number.

Merchant Pipe.—There is a fair volume of new business locally, and in oil country goods many orders are being placed owing to the increasing development in anticipation of the shortage of oil that is in sight. Jobbers' discounts on Steel Pipe are as follows in carloads:

	Black.	Galv.
1/2 and 3/4 in.....	58.5	42.5
3/4 in.....	60.5	46.5
1 in.....	62.5	50.5
1 1/4 to 6 in.....	66.5	56.5
7 to 12 in.....	63.5	48.5
Extra strong, plain ends:		
1/2 to 3/4 in.....	51.5	39.5
3/4 to 1 in.....	58.5	46.5
1 1/4 to 8 in.....	54.5	42.5
Double extra strong, plain ends:		
3/4 to 8 in.....	47.5	36.5

Boiler Tubes.—Stocks are rather low, with prices high and firm. Local consumption has steadily improved since the boilermakers' strike was settled. Most of the shops are fairly busy on new work, making up for lost time. The prospects for the future are good, much marine repair work being in sight. On account of the great distance from the base of supplies it is necessary to carry a wide range of sizes here. It is very difficult to get orders filled promptly from the East just now.

Rails and Track Supplies.—Aside from the sale of 1800 tons of 75 and 60 lb. Rails, taken by the Pennsylvania Steel Company for delivery to the Northwestern Pacific Railroad for its line between San Francisco and Eureka, Cal., there has been nothing doing. An order for about 220,000 Tie Plates was also placed by the same road with the Railroad Supply Company of Chicago. There is much inquiry for Rails and Track Supplies from southern California, but few purchases are expected in northern California during the remainder of this year. The Western Pacific Railway has ordered 12 highway crossing alarms from the Railroad Supply Company, for use at Stockton, Cal., and has specified the use of alarms at all grade crossings on the 900 miles of the new road between San Francisco and Salt Lake City, which is to be completed within one year from date. The Amador Railway Company, backed by French capitalists, has taken over the Lone & Eastern Railway and will extend the line beyond Ione, Cal. The company will be in the market for Rails soon.

Wire Products.—A prominent representative of one of the large Wire manufacturing interests says of local conditions: "Stocks of Wire Products are approximately normal. Jobbers are evidently aiming to carry only a minimum quantity, just about sufficient to take care of their trade. Any less would cause actual shortages. Collections from the jobbing trade are about normal. From some of the large industrial corporations collections are slow and have been for some time. During October and November the trade looks for a continuance of tight money, owing to considerable sums being tied up in taxes. Better conditions are hardly expected until after the close of the year. Such orders for materials as are placed now are usually accompanied by requests, stating the urgency of the need for immediate delivery."

Cast Iron Pipe.—The United States Cast Iron Pipe & Foundry Company, R. W. Martindale, Pacific Coast sales manager, was the successful bidder on the 6000-ton contract for the use of the city of Los Angeles, Cal., in its distributing system. The Pipe ranges from 4 to 24 in. in diameter. The district headquarters of the company are at room 799, Monadnock Building, San Francisco.

Sheets.—On both Black and Galvanized Sheets there is a fair demand, but the local sheet metal works are not so

busy as they were the first year after the fire. Jobbers seem to be well supplied, especially with Galvanized, and are taking most of the business, as the large shops are not placing orders for mill shipments. They now prefer to place pick-up orders as they require from the jobbers. The market is steady and No. 26 Galvanized is being sold at \$4.50 to \$4.75.

Metal Market.

NEW YORK, October 16, 1907.

Pig Tin.—The daily drop in prices continues on the London exchange, while the New York market, although above parity on account of the small supply here, keeps pace in the downward trend. No new theories are advanced as to the cause of the decline, but the financial situation seems to be playing a more important part than usual. The following daily prices show the course of the decline:

	Cents.
October 10.....	33.20
October 11.....	32.00
October 12.....	32.10
October 14.....	31.50
October 15.....	31.30 to 31.35
October 16.....	31.20

The little business transacted this week has not cut into the meager surplus held in this country to any extent; this situation does not promise to be relieved for some time, as the cargo on the Gibraltar amounting to 520 tons has been largely sold, and Tin from the Minneapolis, which will arrive October 21, is not coming on the market. The arrivals so far this month aggregate 1660 tons, and there are afloat for American ports 1340 tons. The London market closes firmer at £136 15s. for spot and £134 15s. for futures. Much of the Tin now being delivered was purchased at around 38c. A heavy loss has been distributed throughout the trade.

Copper.—The market looks as weak with Electrolytic selling below 13c. for export, as it did two months ago. Reports of good sales made at 13.50c., not only lack confirmation, but seem unreasonable in the light of subsequent events. The range of prices is considerably wider than usual, but the following represents actual transactions, the outside being for small lots, say, 30 tons and over, for domestic delivery and the inside round lots for export: Lake, 13.25c. to 13.75c.; Electrolytic, 12.87½c. to 13.37½c.; Casting, 12.75c. to 13c. There is not the secrecy regarding transaction there once was, and even the larger selling agencies state they would cut their price considerably for a desirable order. The financial situation is the cause of the decline, and it is openly asserted that the leading producer is so much in need of funds that almost any offer for a large tonnage would be accepted. The market, however, is in a healthier state, and, although the old price has been cut in two, it is needless to state that the present price cannot be cut much. The most unfavorable feature is the fact that the surplus accumulation is growing larger, in spite of the fact of production being curtailed, and exports are heavy, amounting to 13,806 tons for the first half of the month. The London market continues to decline, the closing quotations, however, being above the low figure at £60 for spot and £58 15s. for futures, the latter having sold down to £56 10s. earlier in the day. Best Selected is held at £64, equivalent to 13.25c.

Lead.—There is little activity in the Lead market, and prices are unchanged at 4.70c. for spot, New York; 4.65c. for shipments, and 4.50c. in St. Louis. The terms and price of the American Smelting & Refining Company continue unchanged.

Spelter.—There is a steady undertone to the Spelter market, and, although prices are slightly easier in the West, they are considerably firmer in the East. Prime Western, New York delivery, cannot be had under 5.55c., and in St. Louis the market is quoted at 5.35c. to 5.40c.

Antimony.—Prices are higher, but there is little business. Spot deliveries of Hallett's can be had at 11c. and Cookson's at 12c., while imports are obtainable at concession of ½c.

Old Metals.—The last decline in the price of Copper has nearly unnerved dealers in Scrap, and while they are extremely reluctant buyers are anxious sellers. The following dealers' selling prices could be shaded for desirable orders:

	Cents.
Copper, Heavy and Crucible.....	12.00 to 12.50
Copper, Heavy and Wire.....	11.50 to 12.00
Copper, Light and Bottoms.....	11.00 to 11.50
Heavy Machine Composition.....	12.00 to 12.50
Brass, Heavy.....	9.00 to 9.50
Brass, Light.....	7.25 to 7.50
Clean Brass Turnings.....	7.75 to 8.00
Composition Turnings.....	10.50 to 11.00
Lead, Heavy.....	4.50
Lead, Tea.....	4.25
Zinc Scrap.....	4.25

Ferroalloys.—A sale of 2500 tons of Ferromanganese to Pittsburgh parties at under \$54, delivered, was the feature of the week. For 50 per cent. Ferrosilicon, on dock, \$103 is quoted, and January delivery can be had at \$100.

Tin Plate.—Trade is slightly easier, but prices are firm, in spite of the decline of 10c. a pound, in Pig Tin, at \$4.09, New York, and \$3.90, Pittsburgh. The price in Swansea has again declined, being quoted at 14s. to-day. This represents an extreme drop of over 40c. this year.

The thirteenth annual issue of the comparative statistics of copper, tin, lead, spelter and other metals as compiled by *Metallgesellschaft* and the *Metallurgische Gesellschaft*, Frankfort-on-the-Main, has just been received. The present volume is unusually full of valuable statistical information regarding the production, consumption and movement in and out of the principal countries of the various metals. It is compiled with care, is printed in English, and the units are metric tons for production and pounds sterling and cents for prices. An interesting table is the price of tough copper from the year 1780 to 1900 for each month in every year given in pounds sterling. The highest price reported is £170, which ruled from June, 1809, to October, 1810. The lowest average monthly price is of comparatively modern date, being £41, which prevailed during June and July, 1894.

New York.

NEW YORK, October 16, 1907.

Pig Iron.—Eastern furnace interests appear to agree in the conviction that the supply available to the district north of the Potomac and east of the Allegheny Mountains is so limited and the costs so little capable of readjustment for the early future that present prices represent the point below which it is impossible to go. The result is that offerings are less urgent than they have been. We quote Northern Iron, tidewater, \$21.25 to \$21.75 for No. 1 Foundry, \$19.75 to \$20.25 for No. 2 Foundry, and \$19.25 to \$19.50 for No. 2 Plain. Alabama Irons are quoted nominally \$22.25 for No. 1 Foundry and \$21.75 to \$22 for No. 2 Foundry.

Steel Rails.—A sale of 2000 tons to the Southwestern Railroad of Texas for delivery this year has been made by the Pittsburgh mill, and there is some scattering inquiry both East and West. No indications of a buying movement appear, though the meeting of the American Railway Association in New York on October 30 may furnish a technical reason for ending the period of uncertainty and mystery relative to Rails for next year. That a new and heavier section will be adopted by a number of railroads seems certain, but neither on this nor on the questions of carbon content and discards is there likely to be unanimity among the railroad companies.

Structural Material.—New work is scarcer, though there is little disposition on the part of projectors of smaller or moderate sized construction jobs to postpone or abandon their plans. Thus the aggregate of going business is more satisfactory than might be judged from the financial situation in New York. The receivers of Milliken Brothers, Inc., being now in position to give prompt delivery on some of the Structural Steel work required for the new Pennsylvania Terminal Station in New York, have been awarded 1000 tons for prompt delivery, and the amount of the original Milliken contract transferred to the American Bridge Company is reduced by that amount. In the past week the Erie Railroad bridge over the Hackensack River has been placed with the American Bridge Company, which has also secured 500 tons of bridge work from the Pittsburgh & Lake Erie and 300 tons from the Pennsylvania Railroad. The Boston & Maine and the Baltimore & Ohio have let some small bridges amounting to 300 tons, and the Erie is getting bids on four or five small structures. The Buffalo Structural Company and the Penn Bridge Company have taken orders for Steel viaduct work for New York State electric roads amounting to 1000 tons. In this city Lewinson & Co. have taken the general contract for an armory in the Bronx requiring 1700 tons. The fire at the Pencoyd, Pa., plant of the American Bridge Company was in the storehouse for erecting equipment, this being a mile distant from the Structural plant. The fabricating shops will not be interrupted, and the fire therefore will not prevent the making of a record output in the company's shops this month. Up to October 11 23,000 tons had been fabricated in all the plants of the company, and the total for the month will no doubt reach the expected 60,000 tons, which would compare with 58,700 in August this year. There is still considerable pressure on all fabricating plants to get out work. At San Francisco some new contracts are likely to be given out soon. We quote tidewater deliveries on mill shipments as follows: Beams, Channels, Angles and Zees, 1.86c.; Tees, 1.91c. On Beams, 18 to 24 in., and Angles over 6 in., the extra is 0.10c. Sales out of stock, of material cut to length, are made at 2½c. to 2½c.

Bars.—The demoralization on the Stock Exchange has apparently had a discouraging effect on buyers of Bar Iron, and orders have recently been less numerous. While the leading mills continue to quote 1.60c., Pittsburgh, or 1.76c., tidewater, this price is being slightly shaded by quite a num-

ber of the smaller mills. Steel Bars continue to be quoted at 1.60c., Pittsburgh, or 1.76c., tidewater, with possibly a somewhat better volume of business and greater difficulty in securing prompt deliveries than of Bar Iron.

Plates.—While the Eastern mills are evidently still well supplied with orders, they are, nevertheless, becoming a little more anxious for new business, and inducements are being offered of quite prompt shipments. Prices are firmly held, as follows, for tidewater delivery: Sheared Tank Plates, 1.86c. to 1.96c.; Flange Plates, 1.96c. to 2.06c.; Marine Plates, 2.26c. to 2.36c.; Fire Box Plates, 2.75c. to 3.50c., according to specifications.

Cast Iron Pipe.—Although it was stated last week that European bidders had been successful in securing a large Cuban order for Pipe, it now appears that conditions as to delivery were imposed by the buyers which could not be met by the foreign makers, and therefore American manufacturers were awarded 6200 tons at a considerably higher price. The other Cuban business which has been pending for some time now seems less likely to go abroad. General business is extremely quiet, only small orders being placed for finishing work which had been begun earlier in the year. New undertakings are not coming up, and it is likely that they may be postponed until conditions in the Pig Iron market become more settled. Prices are continued at \$33 to \$33.50 per net ton at tidewater on carload lots of 6 in.

Old Material.—While the quantity of Scrap held by dealers is not heavy, yet the fact that consumers are buying but sparingly and bidding under recently prevailing prices makes the market look weak. Of all classes of Old Material the scarcest is Stove Plate, on which the price is firmly held. The money market is of course responsible in large part for the quiet conditions now prevailing. Until an improvement is seen in this respect not much activity is looked for. Quotations per gross ton, New York City, are as follows:

Old Girder and T-Rails for melting.....	\$13.00 to \$13.50
Heavy Melting Steel Scrap.....	13.00 to 13.50
Old Steel Rails, rerolling lengths.....	16.00 to 16.50
Relaying Rails.....	26.00 to 26.50
Old Iron Rails.....	20.00 to 20.50
Standard Hammered Iron Car Axles.....	24.00 to 25.00
Old Steel Car Axles.....	19.00 to 19.50
No. 1 Railroad Wrought.....	16.00 to 16.50
Iron Track Scrap.....	14.50 to 15.00
No. 1 Yard Wrought, long.....	14.50 to 15.00
No. 1 Yard Wrought, short.....	14.00 to 14.50
Light Iron.....	9.00 to 9.50
Cast Borings.....	10.50 to 11.00
Wrought Turnings.....	11.50 to 12.00
Wrought Pipe.....	11.50 to 12.00
Old Car Wheels.....	22.00 to 22.50
No. 1 Heavy Cast, broken up.....	16.50 to 17.00
Stove Plate.....	14.00 to 14.50
Grate Bars.....	12.50 to 13.00
Malleable Cast.....	15.50 to 16.00

Iron and Industrial Stocks.

NEW YORK, October 16, 1907.

The industrial stocks have suffered serious declines since the date of our last report. On Thursday of last week the decline was especially severe in such stocks as Can, Car & Foundry, Locomotive, Pressed Steel Car, Cast Iron Pipe and Steel Foundries, although transactions were light. On that day General Electric also showed marked weakness, selling down to 113½ under the pressure of liquidation by some distressed holder. Westinghouse Electric on the same date touched 120. On Friday the decline in the industrial stocks continued and lower values were reached on some stocks. On Saturday, Westinghouse Electric sold down to 110. The decline in the general line of iron and steel stocks continued to some extent on Monday, but a slight recovery took place and a somewhat better level of prices was then maintained, both on that day and on Tuesday. The range of prices on active iron and steel stocks from Thursday of last week to Tuesday of this week was as follows: United States Steel common 22¼ to 25¾, preferred 82 to 86¾; Car & Foundry common 27¼ to 32¾, preferred 83 to 89¾; Locomotive common 44¼ to 48½, preferred 90 to 97; Steel Foundries common 6 to 6½, preferred 26 to 32; Colorado Fuel 15 to 17¼; Pressed Steel common 18¼ to 21¼, preferred 67½ to 75; Railway Spring common 27½ to 30¾, preferred 78 to 81¼; Republic common 17¾ to 19¾, preferred 65¾ to 70¼; Sloss-Sheffield 37¼ to 40, preferred 95; Cast Iron Pipe common 19 to 26¼, preferred 65 to 72½; Can common 3¼ to 3¾, preferred 43½ to 45½. Last transactions up to 1.30 p. m. to-day are reported at the following prices: United States Steel common 22½, preferred 81¾; Car & Foundry common 28¾, preferred 85½; Locomotive common 45½; Colorado Fuel 15¾; Pressed Steel common 19½, preferred 70¼; Railway Spring common 29½; Republic common 18, preferred 65½; Sloss-Sheffield common 36; Tennessee Coal 135.

Dividends.—The International Steam Pump Company has declared a quarterly dividend of 1½ per cent. on the preferred stock, payable November 1.

The National Machine Tool Builders' Association.

Sixth Annual Convention, October 15 and 16, in New York.

A large attendance marked the opening of the sixth annual convention of the National Machine Tool Builders' Association, which was held in the Hotel Imperial, New York, on Tuesday and Wednesday, October 15 and 16, and the sessions of the organization were replete with discussions of vital interest to the trade. Previous to the opening of the convention on Tuesday morning there was a general gathering of the members in the room set apart for their use, and the prospect for future business was informally discussed. The sentiment of many members corroborated those expressed in the president's address that the outlook is good, some stating that they have work enough on hand to keep their shops busy for several months. A number of dealers attended the session, the meeting giving the trade in New York City an opportunity to meet manufacturers from out of town with whom they do business.

The President's Address.

The annual address of President E. M. Woodward was an encouraging one, and he took occasion to refer to present business conditions as being entirely satisfactory. Mr. Woodward said in part:

The hand of time on our fiscal dial points to the fact that another year has passed, and warns us that we are largely responsible for the betterment, or otherwise, of the social and business relations with each other and of the condition of our association. Machine tool builders of the United States have been benefited in many ways by the existence of this organization, and I believe that through its influence still greater benefits will be derived. Much interest is now centered on cost systems, contracts with apprentices and diplomas for apprentices. Our Committee on Apprenticeship and Diplomas has done good work, and I believe is about to make a final report. Our Committee on Responsibilities of Foundrymen has a great work to perform, and with the united support from each member of this association I believe its efforts will be crowned with success, beneficial to all of us.

We have had an era of prosperity, the longest ever witnessed in this country, and this prosperity has been in the extreme to such an extent that we have been overloaded with orders, and have strenuously endeavored to execute them. The large and increased amount of business done throughout the United States has necessarily made large demands on capital, and consequently made the interest rate for money high. When money is high the business world commences to curtail, and a curtailment in business, particularly in the manufacturing interests, means depression.

The present business conditions in this country seem to me to be peculiar. Our country is in a good condition. In most sections our grain crop is good and brings good prices. There is a demand for more railroads and ships to carry our products. What railroads we have are short of rolling stock, and have been unable to promptly convey our products, all of which indicate that there is a necessity for more machinery. It seems to me that the amount of money we have in circulation in the United States is insufficient for the large volume of business we handle. If we are to have a depression in our machine tool manufacturing I think that it is wise that we should heed the warning cry sent out by our secretary, "In time of peace prepare for war."

Our association has stood for a great deal, and should now stand for the protection of each member in sustaining the present prices for machine tools. The reduction from our present prices will not create a demand. No more machine tools will be sold because the prices have been reduced. If our product is to be reduced in quantity, it is necessary that the present prices should be sustained in order that our loss and gain account on the ledger show a balance on the right side.

The membership at the close of the semi-annual convention held May 14 and 15, 1907, was 76; admitted since, 6; total 81. The financial condition of this association is good.

Mr. Woodward also took occasion to state that he would under no circumstances consent to a renomination. He gave it as his opinion that it was time the honor was conferred on some other member of the association.

Secretary P. E. Montanus spoke in his usual happy vein and congratulated the members on the large at-

tendance. He called attention to the fact that the organization is growing rapidly, and added that members seem to be taking an added interest in the association, concluding his address by referring to the past year's business in the machine tool industry in glowing terms and expressing his confidence in the future.

The Convention Committees.

Directly after the addresses of the officers President Woodward announced his committees for the convention, as follows: Committee on Resolutions: C. S. Johnson, Herbert E. Flather, B. B. Bullen. Press Committee: E. M. Woodward and P. E. Montanus. Nominating Committee: C. H. Alvoid, P. C. Fosdick and J. H. Johnson, Jr. Auditing Committee: G. W. Fifield and G. A. Muller. Committee on Place of Next Meeting: A. E. Newton, A. H. Tuechter and George J. Burns.

Eleven new members were enrolled, as follows: Champion Machine Tool Company, Cincinnati, Ohio; Fellows Gear Shaper Company, Springfield, Vt.; E. J. Flather Mfg. Company, Nashua, N. H.; Lucas Machine Tool Company, Cleveland, Ohio; Seneca Falls Mfg. Company, Seneca Falls, N. Y.; Eberhart Bros. Company, Newark, N. J.; Cincinnati Lathe & Tool Company, Cincinnati, Ohio; Muller Machine & Tool Company, Cincinnati, Ohio; Hilbert Machine Company, Cincinnati, Ohio; Aurora Tool Works, Aurora, Ind.; Western Machine Tool Works, Holland, Mich.

Following the announcement of the committees, the secretary and treasurer submitted their reports, which showed the organization to be in a flourishing condition. Other routine business of minor importance took up the morning session.

Tuesday Afternoon.

At Tuesday afternoon's session a committee from the American Supply and Machinery Dealers' Association, consisting of Henry Prentiss, Prentiss Tool & Supply Company, New York; O. P. Meickel, Baird Machine Tool Company, Pittsburgh, Pa., and W. R. Colcord, Colcord Machinery Company, St. Louis, Mo., visited the meeting and in behalf of their organization expressed their good will and congratulated the manufacturers on the success of their association. A number of the manufacturers responded in kind.

Freight Charges.

The question of freight charges on fractions of carloads, when goods are shipped in one or more carload lots, was brought up by Mr. Montanus and came in for considerable discussion.

Mr. Montanus pointed out that the manufacturers formerly had an understanding with the railroads whereby they were allowed the carload rate on anything in excess of a carload when shipping one or more carloads of material. He said that of late the railroads have been charging full freight rates for these excess shipments, and he recommended the association to do something toward securing the old terms for the manufacturer. The president added that it would be well to look into the matter, and on motion Mr. McLaughlin, Mr. Newton and H. S. Johnson were appointed a committee to investigate and report at the next meeting of the association.

On Exposition Displays.

F. M. Huschart, chairman of the Committee on Expositions, which was appointed at the spring meeting of the association to look into the advisability of exhibiting at expositions, reported that this committee had made a canvass of the members of the association asking them for an opinion on the subject. He stated that the replies received from the communication were varied, but it seemed to be the general opinion that it does not pay manufacturers to show at expositions in this country. He declared that as a rule most of those who have made such displays of late have done so because they feared their competitors would be represented. Some of the members agreed that expositions on the continent of Europe paid better than such shows in this country, but all of them agreed that arranging and maintaining such exhibits was a great annoyance and expense. The report

was accepted as a sentiment of the association and the committee was continued.

The convention adjourned for the afternoon after announcement had been made that the representatives of the various lines of machine tools representing the association would meet in special committees and report to the convention at large on Wednesday morning as a Committee of the Whole. The committees were made up as follows: Lathe Committee, Planer Committee, Shaper Committee, Boring Mill Committee, Radial and Upright Drill Committee, Milling Machine Committee, &c.

WEDNESDAY MORNING.

There was considerable discussion at Wednesday morning's session over a resolution to engage an expert to determine the cost price of machine tools. A committee appointed at the previous convention recommended that \$2000 be appropriated to engage a man to visit various manufactories and make comparison as to costs on which to base a general report on cost problems. Several members opposed the motion on the ground that such a report might not benefit some members in whose shops unusual conditions prevail. The motion was finally passed with the recommendation to the committee that it instruct its expert to submit a practical synopsis of his ideas on making a uniform basis of arriving at costs.

The Committee on Next Place of Meeting recommended that the spring convention be held at Atlantic City some time in May, the date to be arranged later by the Executive Committee of the association.

The committee appointed at the spring meeting to devise a plan for fixing the responsibility for defective castings on foundrymen reported that it had not gone into the subject as thoroughly as it had hoped to, but promised a definite report at the next meeting. C. H. Norton, who reported for the committee, stated, however, that he hoped the association would get together as a body and form a plan by which foundrymen could be made to share in the expense attached to such errors. He said: "We do not expect to put any extra expense on the foundrymen, but we want to get together and have them accept their reasonable responsibilities in the matter."

Uniform Contracts.

A resolution to appoint a committee to frame a uniform form of contract for selling machine tools, which might meet the approval of the dealers, was unanimously adopted, and C. A. Johnson of the Gisholt Machine Company, Madison, Wis., and J. B. Doan of the American Tool Works Company, Cincinnati, were appointed to prepare a contract to be submitted at the next meeting. It was pointed out that some selling agreements now in force work to the disadvantage of both dealers and manufacturers, especially in relation to ascertaining the credit standing of purchasers.

The Committee on Apprenticeship Agreements recommended that the association adopt a form of diploma to be given to apprentices who complete their time to the satisfaction of their employers, and on motion of E. P. Bullard, Jr., of the Bullard Machine Tool Company, Bridgeport, Conn., the form of contract submitted at the last meeting is to be put in force by members of the association and designated as "The National Machine Tool Builders' Apprenticeship Contract." C. A. Johnson advised that as in some States the laws on apprenticeship agreements differ, it would be well for manufacturers in districts where changes in the regular form are necessary to submit such changes to the Executive Committee of the association, and a motion to that effect was passed. The Committee on Apprenticeship Agreements was authorized to have a suitable diploma engraved, to be awarded to apprentices on their graduation. William Lodge of the Lodge & Shipley Machine Tool Company, Cincinnati, in discussing the subject, declared that the apprenticeship systems in vogue do not fit existing conditions, as it is necessary to separate different branches of the trades in order to produce specialists among the mechanics.

Election of Officers.

The election of officers brought about a complete change in the make up of the governing body. Nomina-

tions were made from the floor, and the officers chosen were: President, Fred. L. Eberhardt, Gould & Eberhardt, Newark, N. J.; first vice-president, C. A. Johnson, Gisholt Machine Company, Madison, Wis.; second vice-president, E. P. Bullard, Jr., Bullard Machine Tool Company, Hartford, Conn.; secretary, P. E. Montanus, Springfield Machine Tool Company, Springfield, Ohio; treasurer, W. P. Davis, W. P. Davis Machine Company, Rochester, N. Y.

Wm. C. Redfield, president of the Sirocco Engineering Company, 138 Cedar street, New York, returned October 10 from a trip to the parent company, the Sirocco Engineering Works, Belfast, Ireland. He found the plant abroad very busy. A large, new, additional factory has just been finished and equipped on modern lines. Mr. Redfield obtained complete data for use in the American factory now being adapted to the manufacture of the Sirocco turbine blower at Green Island, near Troy, N. Y. The American company has taken over a factory plant at that point, the contractors are at work fitting up the building for its prospective use and the officials of the company are now looking for tenders for the necessary machinery to constitute an equipment suitable for the manufacture of Sirocco centrifugal fans, blowers, pumps and other apparatus heretofore imported from Belfast.

In the coming year the Pittsburgh, Bessemer & Lake Erie Railroad will use more than 70,000 steel ties for renewals and repairs. By the end of next year 90 miles of its track will be laid with steel ties. The *Railroad Gazette* says that railroads controlled by the United States Steel Corporation are now using over \$500,000 worth of steel ties, or enough to lay 160 miles of track. Roads not identified with the corporation are using about 120,000 steel ties on 40 miles of track. The present year the company has sold about 3000 tons of ties. A plan has been completed whereby the ties can be insulated, making them available for electric roads.

The American Wire Brush Company, New York, states that an error has been made in these columns in referring to the construction of the Minerva brush for foundry use, boiler cleaning, &c. The brush is not made with hollow wire, as stated, but with a hollowed back, which gives the wires a thorough chance to move and thus adapt themselves to the surface of the article to be cleaned.

The Cutler-Hammer Mfg. Company, electric controlling devices, Milwaukee, Wis., which some time ago purchased the Wirt Electric Company, Philadelphia, has consolidated the Wirt business with that of the Cutler-Hammer branch plant at Park avenue and 130th street, New York, where the manufacture of Wirt apparatus will be continued.

A Paterson, N. J., dispatch of October 15 says that a special meeting of the directors of the Passaic Steel Company will be held to act on a proposition to sell the plant to the United States Steel Corporation.

The International Bureau of Weights and Measures assembled at Sevres, France, October 15. Prof. Samuel W. Stratton, director of the National Bureau of Standards at Washington, and Henry Vignaud, first secretary of the American embassy at Paris, are the delegates of the United States.

The officers and directors of the Lackawanna Steel Company are making a tour of the company's properties this week, beginning in the Lebanon Valley and going later to the Pennsylvania coal mines and then to the steel plant at Buffalo.

A meeting of presidents of the various subsidiaries of the United States Steel Corporation is being held in Chicago this week, attended also by a number of the officers of the corporation.

The Machinery Trade.

NEW YORK, October 16, 1907.

Some of the larger projects outlined some time ago have shown evidence the past week of confidence in the return of a better business in the near future by coming into the market for machinery to carry out their plans, but these have been so few and there have been so many having plans for expansion that are holding off from making purchases that the trade generally has shown no improvement. This hesitancy on the part of prospective buyers seems to be extending, and many of them admit that they prefer to wait and see how conditions are around the first of the year before placing orders. The recession in trade is not wholly responsible for holding plans in abeyance; the belief, which is spreading, that prices on machinery will be reduced in the near future is undoubtedly causing many to keep out of the market at the present time. As a consequence of the uncertainty of business conditions trade continued rather quiet the past week. Orders and inquiries were not very numerous nor of large proportions, the greater part of the transactions covering one or two tools. Since our last report but little has been heard from the railroads beyond the decisions to make further retrenchment.

The beginning of a recession in trade naturally suggests a reduction in prices, and as the lower levels are reached the opinion becomes more general that it is a wise policy to gradually reduce prices to conform with the lessening of demand. In view of the falling off in business during the past two months, considerable is heard in the trade favoring a reduction in prices of machinery.

The Ingersoll-Rand Company, New York, which has spent a large amount of money exploiting and introducing its pneumatic hammers and drills, believing that by selling at lower prices twice as many will be used, has reduced prices and has sent out a list giving the new prices for its pneumatic tools.

Because of the reduction in the price of copper, manufacturers of brass goods are understood to be preparing to reduce prices. One important manufacturer will soon announce a cut in prices.

A large number of manufacturers from out of town attended the convention of the National Machine Tool Builders' Association at the Hotel Imperial Tuesday and Wednesday. An important feature of the convention was the many local dealers who were in attendance, and who displayed an especial interest in the proceedings. The meetings gave the manufacturers and their agents another opportunity to exchange views on the business situation and to cement their friendship. A detailed report of the convention is printed in another column.

The Electrical Show which closed in Madison Square Garden on October 9 was visited by a large number of machinery people, and local machinery men who had exhibits there declare that there was a larger attendance of the trade than has been at any recent trade exhibition in this city. This was due to the fact that there was an unusually large machinery exhibit at the show, especially in the line of motor driven tools. Many of the out of town people who attended are interested in the machinery business, and it is expected that some business will result to the trade in consequence of the show.

The United States Steel Corporation is doing some purchasing for its plant at Gary, Ill., and judging from some of the inquiries recently placed in the trade this recent buying movement includes requirements for some other plants. Most of the inquiries have come from Pittsburgh and some machine tool houses have landed some of the business. There have also been some inquiries in the line of power equipment for the Gary plant, although it is understood that the engines have been practically decided upon. The buying, coming as it does just now, has given the trade considerable confidence as to the future outlook, and it is taken as a sign that the company expects to go on with all of the improvements which have been outlined in these columns from time to time.

The fire this week at the Pencoyd Works of the American Bridge Company, Philadelphia, Pa., caused quite a heavy financial loss, but will in no way interfere with the operation of the plant. A great deal of outdoor machinery, such as derricks, hoisting engines, &c., was destroyed, and although the company makes a good deal of the apparatus itself, it will have to purchase considerable new equipment to replace that destroyed.

Considerable machinery will be required by the Coatesville Boiler Works, Coatesville, Pa., which intends to erect a new plant, which will be equipped for the manufacture of boiler fronts and other castings of cognate nature, such as grate bars, &c. A tract of land just outside of the city limits has been purchased, upon which will be erected a foundry

and machine shop, each of the buildings to be about 60 x 120 ft. Plans have not been entirely prepared.

It is reported that the Westinghouse Machine Company, which established the town of Trafford City, just above the Westinghouse town of East Pittsburgh, Pa., will concentrate all its plants at Trafford City. A new plant will be erected at once, and the total cost of the improvement will probably reach \$6,000,000. The various plants of the company are located throughout Pittsburgh and Allegheny, while another of its large plants is the Walker Machine Company at Cleveland. This, with all the others, will be taken to Trafford City. About 10,000 men are employed by the company in the machine shops.

Bids are being received by Isaac A. Johnson & Co., Spuyten Duyvil, N. Y., for the erection of a building 60 x 120 ft., which is to be used for making steel castings. The company has had the erection of this structure in contemplation for some time.

There are some inquiries in the market from the American Locomotive Company, but it is understood that the buying is not for any very large project, and it is thought probable that the equipment is intended to replace other machinery in existing plants.

The new plant of the Pittsburgh Chain & Forge Company which will be erected at Paden City, W. Va., under the supervision of the Schlieper Engineering Company, Pittsburgh, Pa., will be equipped with gas engines, electric motors, testing machine, forge fires, alligator shears, &c. The main building, 60 x 200 ft., work on the construction of which has been started, will be devoted to the manufacture of hand made chains, and as soon as this building is completed a building 50 x 80 ft. will be erected, to be equipped with coke crushing machinery. It is the intention later to erect another building, about 75 x 300 ft., in which a line of general drop forgings will be made, and for the equipment of which steam hammers and other machinery will be ordered.

Charles A. Matcham, president of the Fuller Engineering Company, Allentown, Pa., has purchased property in Reading, Pa., where he intends to erect a cement plant of 3000 barrels capacity per day. Plans have not been entirely completed.

The J. H. Ladew Company, Glen Cove, L. I., has purchased 20 acres of land on the Newark, N. J., meadows for the purpose of erecting a plant for the manufacture of belt and sole leather. It is understood that the company will utilize a large part of its New Jersey plant as tanneries, and work will be begun on the new factory, it is said, this winter.

Judging from some inquiries in the market the buying has not been completed as yet for the large plant to be erected by the Longacre Electric Light & Power Company, 74 Broadway, New York, at 120th street and the East River. The company has specifications out for a structure 200 x 347 ft., and the general contract has been let to the American & British Mfg. Company, Providence, R. I., and 71 Broadway. There will be a number of substations, which have not been entirely decided upon as yet, and it is thought that some of the inquiries out cover equipment for those structures. Walter H. Knight, 74 Broadway, is the consulting engineer, and it is understood that all the buying is to be done through the American & British Mfg. Company. That company will furnish the principal power equipment, but there is a good deal of other machinery to be installed.

The York Haven Water & Power Company, York Haven, Pa., intends to double the capacity of its plant next year on the Susquehanna River by the installation of 10,000 more horsepower, normal capacity, with an overload equivalent to 15,000 hp. The company's business demanded the increased power, as its present 10,000 hp. has been contracted for. Foundations for the 10,000-hp. units are now being put in, and the major portion of the building will be completed this fall. About 300 ft. is to be added to the power house for the protection of the 10,000-hp. units. Contracts are now being prepared for the hydraulic and electrical machinery, and the concreting and other work will be done by the company.

Chicago Machinery Market.

CHICAGO, ILL., October 15, 1907.

Among the orders now being placed for machinery equipment very few are in anticipation of future needs. Here and there plans for plant construction necessitate the placing of orders for delivery some time ahead, but the volume of such business is small. The present condition of the money market offers little encouragement for the development of new enterprises entailing large expenditures. Trade in machine tools, however, evidences a continued demand from established plants, which is more in the nature of replacements than for extension work. It cannot be said that the volume of business of the past week has shown an appreciable increase, but that it holds well up to the business of recent weeks is rather a source of satisfaction than otherwise.

Transactions included the purchase of a number of tools by both the Union Pacific and Chicago & Northwestern railroads. These orders, though comparatively small, are noted as indicating the absolute needs of these interests. It is generally expected that the 'Frisco System will soon be in the market for equipment to supply its new shops at Springfield, Mo. This list is awaited by the trade with much interest, as it represents the most important line of tool requirements in sight for the near future. Encouragement is found in the fact that a better line of inquiries have been coming in lately from the larger industrial plants, and some of these bid fair to develop into orders a little later on.

While a fairly good demand exists for gas engines of small and medium horsepower, this department of the industry is not monopolizing the attention of builders to the practical exclusion of large units, as was the case a while back. This condition is not wholly due to lessened demand, but is influenced to some extent by enlarged output capacities. In other lines also this is a factor to be taken into account in considering the relative differences of supply and demand. For, what with the building of new plants and the very general extension of old ones, within the past year and a half, there has been a very material increase of producing capacity in machinery lines, so that some of the apparent decrease in overcrowding may be charged to this cause instead of being wholly ascribed to lessened demand. While it is generally conceded that for the rest of the year a continuance of the present moderate movement observed in all machinery lines will in all probability prevail, manufacturers and dealers alike regard the situation as distinctly healthful and look for enough business to round out the year with creditable results, both as to volume of business and profits.

It has been decided to rebuild the plant of the Collins & Burgie Company, Marengo, Ill., manufacturer of stoves and ranges, which was destroyed by fire on October 5, together with its finished stock and material. It will require some months to rebuild the new factory and supply it with the new machinery and equipment necessary to resume the manufacture of stoves.

Keys Brothers, Council Bluffs, Iowa, manufacturers of buggies, are rebuilding their plant, recently destroyed by fire, and in addition are erecting blacksmith and gear work shops of about twice the capacity of those destroyed. The new plant will be supplied with electric power. Some of the machinery from the old plant will be used, but additional equipment will be required for which they are in the market.

Plans are in course of preparation for construction of a new plant to be built by the Great Western Smelting & Refining Company, Chicago, at Forty-first street and Lowe avenue. The buildings to be erected will cover an area of 150 x 400 ft., and will be arranged with switch tracks entering the works. Two Swartz melting furnaces will be installed, together with a complete equipment of brass, babbitt and type metal melting pots, and copper, lead and sweat furnaces. An electric traveling crane and an electric trolley hoist will serve the main buildings. While it is the purpose in the beginning to take outside electric current for the operation of the plant, the plans provide an adequate engine and boiler room. This equipment, as a precautionary measure, may be installed at the time of building the plant. The designing architect in charge of this work is W. H. Tomlinson, 17 Van Buren street.

The Spencer Machinery & Tool Company, Spencer, Ind., has been incorporated, with a capital of \$10,000 to manufacture lifting jacks and wrenches. It is also the purpose of the company to engage in the near future in the assembling of automobiles and it desires to receive catalogues from manufacturers of the various parts of automobile equipment. The directors are John B. Runner, John M. Hawkins and William Fender.

The Hall Gas Engine Mfg. Company, Waukegan, Ill., is contemplating the removal of its plant to North Chicago, Ill., where a 4-acre site has been provided for the erection of its machine shops and foundry. This move has been made necessary by the rapid extension of the company's business, which has outgrown its present facilities.

Contracts have been let to the Galena Iron Works Company, Galena, Ill., for rebuilding the power plant and concentrating mill of the Highland Milling Company, Highland, Wis., which were recently destroyed by fire. The power equipment will include a generator of 150 kw., 500 volts, manufactured by the Northern Electric Company, Madison, Wis., and one 200-hp. Bates Corliss engine, made by the Bates Machine Company, Joliet, Ill.

The Vilter Mfg. Company, Milwaukee, manufacturer of Corliss engines and refrigerating machinery, is building an 80-ton ice machine for the Distilled Ice & Cold Storage Company, Los Angeles, Cal., and a 100-ton refrigerating machine for the Los Angeles Brewing Company.

The Allis-Chalmers Company, Milwaukee, recently sold two 1500-kw. steam turbines to the Youngstown Sheet & Tube Company, Youngstown, Ohio. One of the turbines will be used for operating as a condensing turbine, and the

other as a non-condensing, with a steam pressure of 150 lb. to the square inch.

Cincinnati Machinery Market.

CINCINNATI, OHIO, October 15, 1907.

Doubtless the best reflection of conditions as they actually exist in this market will be developed in the course of the convention of toolmen in New York this week, for the heads of practically all the large establishments are there and a very great interest is taken in the meeting by all local manufacturers. From the office men at home it is learned that there is no very great change in trade conditions; there is perhaps a little better inquiry, and no direct cancellations are reported. The nearest approach to this condition found during the week was in one or two instances a request to hold up shipments for a few weeks; some dealers had accumulated stocks in certain lines, and these not moving as rapidly as anticipated necessitated a request to delay. There is no concern manifested over the situation, however, for every local concern is running full time in every department, and while the situation is a little easier, to catch up on delayed bookings will run most of the establishments into the new year without a single new order.

Nearly every one of the big tool concerns announce that they could use more skilled men, and the employment bureau of the Metal Trades Association is always ready to place men of this caliber.

One of the largest producers of tools in this district noted that the tendency is stronger at this time to buy high class tools and fewer second hand than for the past two years. This manufacturer believes that the ante-election period of dullness will be less in evidence the coming year and less noticed by the tool manufacturers than for any previous year, at least within two decades.

Offsetting possible criticism because of the existing inactivity at Cincinnati's new steel industry, the Cincinnati Steel Foundry Company, the announcement of the Block-Pollak Company of Carthage is important. This company will build a \$1,000,000 plant at Steelton, in suburban Carthage and on the property of the company, for the manufacture of steel bars, shapes, angles, &c. Engineers are now working on the plans and drawings will be ready for bids, according to President E. Pollak, within the course of a month or six weeks. The new plant will be a model one in every respect and will give employment to 1000 hands. The company is already well established in a commodious home on a 25-acre tract, where it is making steel and iron car axles and heavy marine and machine forgings. The new establishment will be the first of its kind in the Millcreek Valley.

In line with the sentiment that has actuated President Pollak to enlarge and spread out, the officials of the William Powell Company, maker of brass specialties, on Spring Grove avenue, are arranging to enlarge and improve their already model plant. Engineer W. G. Franz, who is associated with Architect Gustav Drach in the Union Trust Building, is working on plans for an addition to be erected on the south side of the present building. The Powell Company will, after the addition is completed, have a frontage on Spring Grove avenue of 155 ft., the new part measuring 37 x 200 ft. and being three stories in height. It is intended to locate the extended finishing department in the new building, and perhaps part of the power equipment. It is understood that the company is contemplating a change to motor driven machinery.

The Southern Ohio Tin Can Company has been incorporated, with a capital of \$10,000, by John A. Parlin, Samuel L. Yantis, Lillian Stuart, Margaret Miller and A. J. Parlin. The company will manufacture tin cans and the plant will be located in Cincinnati.

Secretary W. L. Finch of the Cincinnati Industrial Bureau will go East in a day or so to meet Wm. Lodge, president of the Lodge & Shipley Machine Tool Company in Philadelphia, where they will inspect the system of building homes for the working men. Mr. Lodge is one of the enthusiastic directors of the Industrial Bureau and several times president, and the Philadelphia visit is in line with a recent movement of the bureau to solve some vexing local problems among the shop men.

The Tudor Boiler Mfg. Company will enlarge and improve its plant on Third street, where it has purchased an unimproved tract adjoining its present plant. The new part will be 19 x 90 ft., and with the old part will give the company 80 x 230 ft.

The Tool Steel Motor Gear & Pinion Company will soon be in operation at its new plant at Linden street and Cook avenue, Carthage, one of Cincinnati's manufacturing suburbs. The incorporation and general facts pertaining to the new organization have already been mentioned in *The Iron Age*. While originally manufacturing motor gears and pinions for electric railroads, the new company will turn out also a general line, including automobile parts. A tool steel face

article has been manufactured under a partnership arrangement for some time, with such success that some local men of means, including C. E. Sawtelle of the Postal Telegraph Cable Company and Messrs. Early and Daniel of the Early & Daniel Company, grain merchants of this city, effected the organization of a company with ample capital to push and enlarge the business. A claim that the gears manufactured by the new company are practically non-wearable under the heaviest machine shop use is made by the officers of the organization.

The company manufacturing the McClintock oil engines at Muncie, Ind., will, it is reported, move the machine shop which has been maintained in Marion, Ind., to Van Buren, Ind., alleging a lack of sufficient patronage to warrant its staying there.

Headquarters for Ohio and a part of Indiana for the Smith Mfg. Company of Chicago have been opened in Columbus at 422 North High street by G. W. Belmont, formerly of Minneapolis. Reorganization of its Ohio sales department has been under way for some time by this company, which manufactures agricultural implements.

Work is progressing on the superstructure of the new 50 x 100 ft. factory building of the Buckeye Pump & Mfg. Company on West Broad street, Columbus. The new addition will be greatly appreciated by the company, which has been cramped for room.

A deed of trust has been filed in the Recorder's office at Lancaster, Ohio, by the Farmers' Co-operative Harvesting Machine Company to Attorney William Davidson. Mr. Davidson, the trustee, and Dr. F. P. Stuckey, president of the company, signed the instrument. The mortgage, given to secure \$150,000 in bonds, covers all its property, including the real estate, factories, machinery, tools, fixtures and equipment. This was done to pay the indebtedness, protect its stockholders and continue its manufacturing business until the company can resume its sale of stock on the co-operative plan.

Charles Schild and James McAdams have formed a partnership in Cambridge, Ohio, for the manufacture of a new drying, hanging and extension bracket on which a patent was granted Mr. Schild May 14. The company has leased the building formerly occupied by the Standard Mfg. Company near the Guernsey Works of the American Sheet & Tin Plate Company. Mr. Schild was for several years identified with the sheet mill and has invented a number of meritorious articles.

An additional furnace is under construction at the works of the Columbus Malleable Castings Company in Columbus, Ohio, which when completed and in operation will give the company a capacity of 40 tons daily. The company reports an increasing demand for gray and malleable iron castings and orders booked several months ahead.

Commissioner Wuest of the National Metal Trades Association reports the acceptance by all members of the call for a meeting of the Administrative Council on October 16 and 17. The latest reports from districts affected by strikes show everything in the best kind of order.

The trouble in the plant of the Christopher Cunningham Company, maker of gas holders, in Brooklyn, is over and men are reported to have returned to work.

Philadelphia Machinery Market.

PHILADELPHIA, PA., October 15, 1907.

There has been a gratifying increase of new business along a number of lines. Merchants generally report a better demand. Sales, while confined almost entirely to single tool propositions, have been in a greater number, and it is said by several dealers that if the same volume of business continues to come out they will be pretty well satisfied under the existing general conditions. The feeling regarding the future, therefore, is more hopeful, but while it is believed that prospective buyers are in many cases quite willing to purchase needed tools, they are handicapped to a considerable extent by financial conditions. Collections are hard to make, and even some concerns that are usually considered to be the very best find it difficult to meet obligations as promptly as they have been accustomed to. There is a tendency, therefore, to scrutinize credits closely, as, when working on a small margin of profit, losses, however small, frequently wipe out profits on a number of sales. What business is done is being transacted on a most conservative basis, and will no doubt be so continued until the general business situation assumes a more satisfactory shape. The demand during the week has been of a rather scattered nature. Sales have ranged all the way from extremely light to heavy tools, the greater number, however, being those of the medium class. Inquiries show some improvement, but there is nothing in the way of a large proposition before the trade. There have been some few specifications from

the railroads, but these have been largely for individual tools for replacement, and but few if any actual orders have as yet been placed.

Manufacturers continue fairly busy, and while some have sufficient work to take them over the turn of the year, others are not so fortunate, and probably two months' work at full capacity would be about the average. Some manufacturers have been reducing forces, and while there has been no general curtailment as yet, mechanics in most branches of the trade are quite plentiful.

The foreign demand has been light. There has been practically nothing done in standard machine tools for export, although some fairly good orders have been placed for special tools. Should the present domestic inactivity continue, there will no doubt be more attention paid to the foreign trade, but costs will have to decrease if this business is to be taken at a profit. Specialties in power transmission machinery continue in good demand, and manufacturers report current business in good shape.

A fair demand continues for second-hand machinery, and while sales have not been large a fair day to day business continues to be done. Spot sales have consisted mainly of the smaller tools, although there has been some demand for heavy tools, which are not in very good supply.

Boilers and engines have not been active. Some fair sized propositions are before the trade, but do not close up promptly. Business in the equipment of the smaller horse-powers has been light, and the trade is not particularly encouraged by the outlook.

Iron and steel foundries are fairly well occupied. There has been a falling off in the demand, and foundrymen are looking for new business aggressively. Contracts for future deliveries are not plentiful, and the greater proportion of the new business is of a day to day character. Deliveries in many classes of work are therefore much improved.

The Philadelphia & Reading Railroad has under way a plan for the general change in the alignment, reduction of grades and double tracking of the Wilmington & Northern Railroad, which it acquired several years ago. Contracts for some of the work have already been placed, and the past week one for a steel bridge over Brandywine Creek, near Coatesville, Pa., was let to L. F. Shoemaker & Co., Philadelphia. This bridge will be of the four-span, deck girder type, for double track, 250 ft. long. The grading and masonry work will be done by Willauer & Co., contractors, Pottstown, Pa.

The Standard Hosiery Company, which was recently incorporated with a capital of \$300,000, has commissioned Sauer & Hahn, architects and engineers, to prepare plans and specifications for extensive improvements to property recently bought by it on Laurence street, above Master street. A new spinning mill five stories high, 50 x 150 ft., is to be erected, as will also an engine and boiler house, 36 x 39 ft.; a picker house, 36 x 44 ft., and a dye and bleach house, 18 x 98 ft. The new buildings are to be of reinforced concrete construction and will cost about \$100,000. New offices will be installed, as will also elevators, steam heating, electric lighting and other modern factory equipment.

The Philadelphia Ship Repair Company has purchased the entire shipbuilding plant of John Mills, at Coopers Point, Camden, N. J. The statement that the company would remove from its present location at Mifflin street wharf to the Camden yard has been officially denied; both plants will be maintained in operation at their present location.

William R. Dougherty, engineer and contractor, has plans posted for a producer house and a double generator gas plant to be located at Riverside, N. J. Plans are by R. D. Wood & Co., Philadelphia.

It is understood that arrangements have been practically completed with one of the Delaware River shipyards for the construction of two steel steamships each of 3000 tons net register, for service between San Francisco, Cal., and Portland, Ore. These vessels are to be adapted for both freight and passenger service, and are to be completed, it is said, in one year's time.

The Hilles & Jones Company, Wilmington, Del., advises us that some little falling off in the volume of new business is to be noted, but that the large number of inquiries received would seem to indicate an early resumption of the satisfactory buying of several months ago. Export business is improving, and a large proportion of the new orders received have been from foreign countries. The recent falling off in business has enabled this company to catch up on its orders to a material extent, and deliveries on its standard punches, shears, bending rolls, &c., can be made fairly promptly on ordinary requirements.

A. L. Henderer's Sons, Wilmington, Del., are calling attention to their hydraulic jacks and boiler makers' specialties by distributing 15-in. brass edged rulers of unusually attractive finish.

Cleveland Machinery Market.

CLEVELAND, OHIO, October 15, 1907.

The local machine tool market shows no improvement in the volume of business, and inquiries are not so numerous as they were a few weeks ago. While a few fair sized inquiries are pending, prospective purchasers are holding back, declining to buy tools to increase the capacity of their plants until the present uncertainty about future business conditions disappears and the demand for their products improves. The business situation and the tightness of the money market is having a similar effect on new industrial enterprise. New or projected concerns are holding off until conditions look more favorable, so that there is practically no demand for tools or machinery from this source. Cancellation orders continue to come in from buyers who were anxious to get the tools when they placed the orders several months ago, but who can get along without them now because of the falling off in their business. One dealer reports the cancellation of orders for four large milling machines that had been placed some months ago by four different concerns. Some tool builders have so caught up on deliveries that they have notified local representatives that they have a few tools of certain sizes ready for immediate delivery.

Nearly all the orders that are being placed at present are for single tools for immediate delivery. Some of the automobile builders are buying a few tools, but their requirements are very light as compared with this time a year ago. Concerns manufacturing automobile parts are now fairly supplied with orders. With improved deliveries on new tools the demand for second-hand tools has fallen off somewhat, but the available supply is not large.

With the falling off in orders, particularly for heavy machinery, manufacturers are showing considerable more activity in looking for new business. While there is less demand in the East most manufacturers of various lines of iron and steel products report that their business in the Central and Western States is holding up fairly well. Iron foundries in this territory as a rule have plenty to do, but they are making very few, if any, contracts for next year, consumers of castings waiting until the pig iron market is established before placing orders. Business among the brass founders is light.

Nearly all the local manufacturing plants have enough orders on hand to keep them busy the balance of the year, and there is a general feeling that before they get caught up on old orders there will be considerable improvement in the business situation.

The American Brass Mfg. Company, now located at 715 Woodland avenue, has purchased a new site on East Forty-ninth street, and will erect a new plant in the spring for the manufacture of plumbers' supplies. The company plans to put up a two-story building, about 50 x 150 ft., which will largely increase its present capacity, and will soon be in the market for equipment for its new plant.

The new plant of the Ohio Ceramic Engineering Company is now in full operation, and the company reports that the demand for brick and industrial cars and brick making machinery is keeping up well. The company has been seriously handicapped during the year as the result of a fire that nearly wiped out its plant early in the spring, just at the time a large addition was being built, but with its new plant it is turning out its products rapidly and expects to be caught up on deliveries in about 30 days. Among other lines the company is now manufacturing cement mixers for the McKelvey Machinery Company.

The Standard Tool Company reports that while there has been some falling off in orders during the past few weeks it is well filled with work for the next two months and has orders on hand that will keep some departments busy for a much longer period. The company welcomes an easing up in the demand in order that it may replenish its stock, which has become greatly depleted as a result of the heavy volume of business during the past year.

The Ohio Blower Company, Cleveland, maker of steam specialties, is placing a new gravity closing ventilator on the market. This company has just received a contract from the Hocking Valley Railroad for the oil separators to be installed in the new shops being erected at Logan, Ohio.

The Henkle Mfg. Company has purchased a site in Canal Dover, Ohio, and will equip a plant for the manufacture of an automatic water spout shift.

The Bunting Bronze & Brass Company, which was formed some time ago to build and operate a plant in Alliance, Ohio, for the manufacture of brass, copper and aluminum goods, has been incorporated with a capital stock of \$50,000 by W. H. Morgan of the Morgan Engineering Company, William Bunting, W. H. Bunting, W. H. Ramsey and E. N. Huggins. William Bunting, who will be general man-

ager, was formerly associated with the Ohio Brass Company, Mansfield, Ohio.

The Columbus Bridge & Iron Company, Columbus, Ohio, will soon be changed from a partnership to a corporation with a capitalization of \$35,000. The company recently purchased an iron plant at Parsons avenue, and the Toledo & Ohio Central tracks, which has been fitted up for the manufacture of structural steel and bridge work. The present partnership consists of O. C. Hearing, W. A. Painter and W. H. Renck.

The Federal Graphite Company, Denver, Colo., has purchased the unused plant of the Western Reserve Pottery Company, Warren, Ohio, and will equip it with machinery for the manufacture of graphite.

New England Machinery Market.

WORCESTER, MASS., October 15, 1907.

The market has not been active, and there seems to be little to indicate an immediate change in conditions. Some new business is being booked, but mostly in small lots. A few cancellations are reported, which was to be expected in the face of the failure of the market to make its usual response to the influences of resumption of business after the hot weather. Some dealers are seeking to have their manufacturers go slow in filling stock orders, on the ground that their stores and storehouses are filling up. But confidence appears to remain that a reaction for the better should be felt soon. In the meantime most manufacturing plants are running full time on old orders, combined with more recently obtained business. Certain lines of production are affected much less than others, and orders continue to be received in satisfactory volume.

The private advices received from Western agricultural sections are full of hope. Ideal harvesting weather, coupled with prices that will net more money for this year's crop than last, will put the Western farmer in more prosperous condition than ever before, and he should be a large buyer of equipment and tools, as well as the luxuries of life, and his total of building and like improvements of his properties should also be felt in the market before a great while, affecting many lines of industries. Machine tool men realize, however, that they would ordinarily be the last to feel the effect of a renewed demand beginning with the retail trade; yet if it should prove that the lull in business is one of a few months only, hardly time enough for general manufacturing to catch up with its deliveries, it is certain that many works would go ahead with enlargements and improvements, planned, but not yet carried out. Here in New England the railroads are looked to for some large business in the early part of next year.

The New England banks are taking good care of their regular customers. The manufacturer, whose business is not so great as to compel him to go into the market with his paper continues to get what money he needs at the regulation 5 per cent., and no drawing in of resources is noted in this direction. Larger concerns, whose paper goes to many banks, are feeling the situation more acutely, as there is a strong tendency on the part of the banks to avoid time loans and restrict paper to call loans, excepting, as stated, with regular customers, who are usually located within the bank's immediate territory and are depositors. One result of the money situation is to make collections slow in some instances. In fact, the complaint concerning collections does not diminish.

An encouraging feature of conditions here is the number of young industries that are springing up. They are individually small as a rule, yet their aggregate purchases of equipment and materials is not an inconsiderable item. Some have already established themselves, while more are making preparations with definite intention to go ahead after the first of the year. The men interested are usually employees of established works, either superintendents, salesmen or practical office men, who would branch out for themselves. Machinery dealers report an almost unprecedented number of such concerns making inquiries and purchasing their initial equipment.

In the Naugatuck Valley the brass mills are not rushed, but the manufacturers of brass goods report that a noticeable improvement has been noted.

The builders of special machinery are not so busy, as they have been in booking new business, yet some of them are still engaged on orders booked some time ago.

The Kinney Mfg. Company, Boston, Mass., reference to which has been made in this column, is to manufacture a new type of engine known as the Kinney Turbo-Motor engine, the invention of J. Royal Kinney, which combines principles of the reciprocating engine and the steam turbine. The company is now organizing on the basis of \$1,000,000 capital stock, and has tentative plans for a large plant in the vicinity of Boston, where the engine will be built. A shop has been temporarily established on Sudbury street, Boston,

where the first lot of engines is being built. It is proposed to adapt it for all classes of power, including marine and other uses where reversing is necessary. It is known in the trade that engineers of undoubted reputation have passed approval on the engine, and that the initial machine has demonstrated the practicability and economy of its operation. Some of the claims of the machine are that it is started, stopped or placed at any intermediate speed by the use of a single lever; it is reversed without throttling by moving a second lever through an arc of 90 degrees; over 100 expansions in small engines and 500 in large units can be obtained with practically no cylinder condensation; no packing being required, steam can be used at very high pressures; the shaft is straight, requiring no cranks; the ratio of area of steam pipe to exhaust pipe is 1 to 50; only two main bearings are required, and there are no points of excessive friction and wear. The results of further tests are awaited with much interest.

The Industrial Building Company, New London, Conn., has been organized to erect an industrial building, space in which will be rented to manufacturers desiring light, heat and power. It is a Connecticut corporation, with \$25,000 capital. The incorporators are B. L. Armstrong, Stephen J. Downey, Thomas W. Casey and Bindloss H. Hillian.

Smith, Day & Co., Baldwinville, Mass., chair manufacturers, announce that they will rebuild the plant destroyed by fire October 10. The loss was \$50,000, with insurance of \$37,000.

The Electric Vehicle Company, Hartford, Conn., has elected a new board of officers, mainly promotions, as a result of the retirement of M. J. Budlong from the presidency. W. G. Henderson is the president; J. B. Entz, first vice-president; H. W. Kyte, second vice-president, and Henry W. Nuckles, secretary and treasurer.

The E. J. Manville Machine Company, Waterbury, Conn., manufacturer of machinery, is bringing out a heavier size of each of its lines of headers, comprising single stroke solid die headers, single stroke open die headers, double stroke solid die headers and double stroke open die headers. The new size in each instance is known as the No. 4. In the first three of these machines the No. 4 constitutes the sixth size and in the double stroke open die machine the fourth size. New catalogues give the specifications for the single stroke and double stroke open die machines. The single stroke takes $\frac{1}{2}$ -in. diameter wire, length of rivet produced is 6 in. and the capacity is 60 per minute. The size of dies is $2\frac{1}{2}$ in.; diameter of punch, $2\frac{1}{2}$ in.; stroke of gate, 8 in.; diameter of feed rolls, 10 in.; section of frame, $7\frac{1}{2}$ x 16 in.; diameter of wheel, 62 in.; face of wheel, 8 in., and weight of wheel, 2000 lb. The net weight of the machine is 16,000 lb., and floor space, 6 x 9 ft. The specifications of the double stroke open die machine are the same as those of the single stroke, excepting as follows: Diameter of first and second punches, $2\frac{3}{4}$ in.; diameter of flywheel, 58 in.; rivets per minute, 55; revolutions of wheel, 110; net weight, 20,000 lb.; floor space, $6\frac{1}{2}$ x $9\frac{1}{2}$ ft.

The New Haven Mfg. Company, New Haven, Conn., manufacturer of machine tools, has elected Eugene S. Bristol president to fill the vacancy caused by the death of Robert Augustus Brown, which occurred September 22. Mr. Bristol is the treasurer and managing head of the Union Trust Company, New Haven, and is a prominent figure in New Haven's financial and business circles. L. Moulthrop continues as treasurer and secretary of the company, and the Board of Directors remains unchanged, excepting in the filling of the vacancy by Mr. Bristol.

Government Purchases.

WASHINGTON, D. C., October 15, 1907.

The Bureau of Supplies and Accounts, Navy Department, Washington, will receive bids until October 29 for the following machinery for the Eastern navy yards: One locomotive crane, one steam hammer, two universal turret lathes, one sandpapering machine, one engraving machine, one nut tapping machine, two valve reseating machines, one compression riveter, one wood worker, one pneumatic drill, one pneumatic hammer, one motor generator set and one motor drive outfit.

The Bureau of Supplies and Accounts, Navy Department, Washington, will receive bids until November 5 for the following machinery for various navy yards: Eight electric drills, six electric grinders, one air hydraulic crane, two instantaneous change gear engine lathes, two head type engine lathes, one motor driven lathe, two high speed lathes, two bolt heading machines, one automatic screw cutting machine, one automatic plug machine, one boring and turning mill and one planer.

The Isthmian Canal Commission will receive bids until November 8, circular No. 397, for boiler feed pumps and other supplies.

The following bids were opened October 8 for supplies for the navy yards:

Bidder 3, Atlantic Works, Philadelphia, Pa.; 7, Bentel & Margedant Company, Hamilton, Ohio; 10, Burke Electric

Company, Erie, Pa.; 14, Berlin Machine Works, Beloit, Wis.; 18, James Clark, Jr., Electric Company, Louisville, Ky.; 21, Cleveland Pneumatic Tool Company, Cleveland, Ohio; 28, D'Olier Engineering Company, Philadelphia, Pa.; 29, Chicago Pneumatic Tool Company, New York; 34, Fox Machine Company, Grand Rapids, Mich.; 35, Fairbanks Company, Philadelphia, Pa.; 43, General Electric Company, Schenectady, N. Y.; 45, Greenlee Bros. & Co., Chicago, Ill.; 48, A. D. Hoermann, New York; 55, Independent Pneumatic Tool Company, Chicago, Ill.; 56, Ideal Electric & Mfg. Company, Mansfield, Ohio; 64, Mechanical Appliance Company, Milwaukee, Wis.; 69, Manhattan Supply Company, New York; 75, Norton Company, Worcester, Mass.; 76, Northern Electric Mfg. Company, New York; 77, National Electric Supply Company, Washington, D. C.; 90, Standard Railway Equipment Company, St. Louis, Mo.; 99, B. F. Sturtevant, Hyde Park, Mass.; 107, J. A. Fay & Egan Company, New York; 111, B. D. Whitney & Son, Winchendon, Mass.; 112, S. A. Woods Machine Company, South Boston, Mass.; 113, Westinghouse Electric & Mfg. Company, Baltimore, Md.; 114, American Woodworking Machinery Company, Rochester, N. Y.; 124, Crocker-Wheeler Company, Ampere, N. J.; 127, Excelsior Equipment Company, Pittsburgh, Pa.; 128, R. W. Geldart, New York; 130, Dezhouche, Hanson & Co., Philadelphia, Pa.; 144, Manning, Maxwell & Moore, New York; 145, Motley, Green & Co., New York; 146, Montgomery & Co., New York; 151, Oliver Machinery Company, New York; 157, J. B. Roache, Brooklyn, N. Y.; 159, Sherman-Brown-Clements Company, New York; 166, Vermilye & Power, New York; 170, Frevert Machinery Company, New York; 172, Crescent Machine Company, Leetonia, Ohio.

Class 11. One planer and matcher—Bidder 3, \$2000; 14, \$3065.17; 107, \$2441; 112, informal; 114, \$2750; 151, \$2998.

Class 12. One band sawing machine—Bidder 3, \$525; 7, \$513; 107, \$795; 114, \$650; 151, \$685 and \$562; 172, \$500.

Class 13. Two molding, shaping, curving and dovetailing machines—Bidder 107, \$1344; 114, \$1428; 127, \$290 and \$340; 151, \$1100.

Class 14. One band scroll and resawing machine—Bidder 3, \$1060; 107, \$1036; 114, \$840.

Class 15. One hand planer and jointer—Bidder 3, \$420; 7, \$586; 14, \$433.60; 34, \$349.75; 35, \$335; 107, \$498; 114, \$435; 151, \$386, \$550 and \$600; 172, \$435.

Class 16. One rip saw—Bidder 7, 1048; 45, \$967; 107, \$946.

Class 17. One molding machine—Bidder 7, \$1076; 14, \$1543.71; 35, \$1280; 107, \$1159; 114, \$1240; 127, \$825; 145, \$1310.

Class 18. One sandpapering machine—Bidder 14, \$1845.27; 107, \$2228; 114, \$1680; 127, \$1900.

Class 19. One scroll saw—Bidder 7, \$417; 35, \$220; 107, \$291; 114, \$375; 127, \$99.

Class 20. One smoothing planer—Bidder 14, \$992.98; 35, \$935; 107, \$1204; 111, \$961.27 and \$1021.27; 114, \$1150; 127, \$655 and \$580.

Class 21. One knife grinding machine—Bidder 14, \$525.58; 127, \$170; 151, \$693; 170, \$448.

Class 31. Three multipolar motors—Bidder 10, \$773.40; 28, \$693; 43, \$756; 56, \$876.55; 64, \$682.50; 76, \$793.65; 99, \$756; 113, \$868 and \$803; 124, \$990.

Class 97. Two rotary pneumatic drills and one non-reversible drill—Bidder 29, \$145; 90, \$155; 128, \$110.

Class 98. Two electric drills—Bidder 18, \$80; 29, \$50; 69, \$110; 77, \$110; 127, \$110; 130, \$110; 144, \$110; 146, \$110; 157, \$110; 159, \$110; 166, \$110.

Class 99. Six air drills—Bidder 21, \$295; 29, \$375; 55, \$294.50; 90, \$360.

Class 105. Two air hammers—Bidder 21, \$65; 29, \$100; 48, \$88; 55, \$74; 75, \$5.40, part; 90, \$70.

The following bids for supplies for the Isthmian Canal Commission, Circular No. 394-A, were opened October 4:

Bidder 9, Fox Bros. & Co., New York; 10, General Electric Company, Schenectady, N. Y.; 17, Manning, Maxwell & Moore, New York; 24, B. F. Sturtevant Company, New York; 25, Western Electric Company, New York; 26, Westinghouse Electric & Mfg. Company, Baltimore, Md.

Class 1. Two direct connected engines and dynamos and two switchboards—Bidder 9, item 2, \$190, 30 days; 10, \$1107, 60 days; 17, \$1342, 60 days; 24, \$1360, 14 days; 25, \$1262, 140 days; 26, \$1122, no time.

The following bids for 65 or more 25-kw. electric generating sets were received September 30 by Major Harry Taylor, corps of engineers, United States Army, at New London, Conn.:

Otto Gas Engine Works, Philadelphia, Pa., \$3400 per set, August Mietz, New York, \$3600 per set.

New York Safety Steam Power Company, New York, \$3618.50 per set.

General Electric Company, Schenectady, N. Y., \$3085 or \$2700 per set.

The B. F. Sturtevant Company, Hyde Park, Mass., has been awarded contract at \$18,824 for the fans and motors for ventilating the House of Representatives office building, bids for which were opened September 21.

The Materne Mfg. Company, St. Louis, Mo., has been awarded contract for the boilers for the officers' quarters at Jefferson Barracks, Mo.

Under bids opened September 24 for supplies for the navy yards the Niles-Bement-Pond Company, New York, has been awarded class 2, one gun boring and turning lathe, \$37,250.

The following awards have been made for supplies for the navy yards, bids for which were opened September 17: Manning, Maxwell & Moore, New York, class 274, one metal band saw machine, \$105.

Oliver Machinery Company, New York, class 276, one pattern makers' speed lathe, \$212.

Westinghouse Air Brake Company, Pittsburgh, Pa., class 277, one air compressor, \$176.50.

American Woodworking Machinery Company, Rochester, N. Y., class 278, one sandpapering machine, \$125.

The Newport News Shipbuilding & Dry Dock Company, Newport News, Va., has been awarded contract for six steel barges for the Isthmian Canal Commission at \$120,000, the award being made under item 2, the barges to be delivered, knocked down, at Colon or La Boca.

The following awards have been made for supplies for the navy yards, bids for which were opened October 1:

Blake-Knowles Steam Pump Company, New York, class 32, one steam pump, \$590.

Frevort Machinery Company, New York, class 124, one extension lathe, \$2794.

Prentiss Tool & Supply Company, New York, class 125, one boring and turning mill, \$2825.

Manning, Maxwell & Moore, New York, class 126, two toolroom lathes, \$1412.

Vandyck-Churchill Company, class 127, one turret lathe, \$1059.

Niles-Bement-Pond Company, New York, class 128, one boring and drilling machine, \$1100; class 129, one milling machine, \$890.

W. S. Foster, New York, class 130, one shaper, \$780.

Under bids opened September 10 for machinery for the navy yards J. B. Roache, Brooklyn, N. Y., has been awarded class 172, six hydraulic jacks, \$2859.60.

Trade Publications.

Mine Locomotives.—Jeffrey Mfg. Company, Columbus, Ohio. Catalogue No. 12. Size 8 x 10 in.; pages 80. This is entitled "The Care of Electric Mine Locomotives in Service," by F. L. Sessions, and gives a general enlightenment on the subject. It deals comprehensively with electrical equipment, the care of locomotives, locomotive troubles, lubrication, repairs to locomotives, and Jeffrey gathering locomotives. Numerous illustrations are given of the locomotives and their parts and also of the company's drills, coal mining machines, coke oven larries, and electric hoists. Specifications of mine locomotives of the inside and outside wheel types, and various tables and locomotive wiring diagrams are included. A table of contents is appended.

Wheel Presses.—E. R. Caldwell & Co., 34 Hilton street, Bradford, Pa. Circular and pamphlet. The circular gives illustrations and descriptions of the belt and motor driven hydraulic wheel presses and a table of dimensions. These presses are of the inclined type, and strength, simplicity in construction and convenience in operation are the claims made for them. The pamphlet contains a list of some users.

Tobin Bronze.—Ansonia Brass & Copper Company, 99 John street, New York. Pamphlet. Devoted to Tobin bronze, a combination of copper with other metals which when rolled out is remarkable for its high elastic limit, tensile strength, hardness and uniform texture. It has a specific gravity of 8.379. Results of tests, tables of approximate weights and testimonial letters are included.

Thermostats and Thermometers.—Parker Mfg. Company, 77 Summer street, Boston, Mass. Five pamphlets. These deal respectively with standard thermostats; standard thermometers made in 4, 6 and 8 in. diameter sizes with Centigrade, Fahrenheit or Reaumur scale; standard recording thermometers; thermometers for mechanical uses, and standard oven thermometers. Brief descriptions, illustrations and prices are given.

Carbureters.—J. P. Kemp, Baltimore, Md. Pamphlet. Descriptive of a carbureter for use in connection with internal combustion engines using gasoline or alcohol as fuel, for which several advantages are claimed.

Graphite.—Joseph Dixon Crucible Company, Jersey City, N. J. Booklet. This is entitled "A Study in Graphite," and gives in detail a series of tests of graphite made by Professor W. F. M. Goss of Purdue University. These tests were not made with a view to finding points for or against graphite, but were conducted in the spirit of scientific research. Illustrations of the testing machines accompany the description of tests.

Hoisting Engines.—Lidgerwood Mfg. Company, 96 Liberty street, New York. Bulletin. Pertains to Lidgerwood electric hoists for direct current, 250 to 500 volts. These are made with single or double drums for general hoisting purposes, in

connection with derricks, &c. A description of their parts, illustrations and tables of sizes and capacities are included.

Electrical Apparatus.—Holtzer-Cabot Electric Company, Brookline Station, Boston, Mass. Three bulletins for insertions in binder. No. 302A, superseding No. 302, deals with dynamotors and motor-generators; No. 303A supersedes No. 303 and is devoted to special elevator motors, and No. 311 to direct connected electric generating sets for gas, gasoline or alcohol engine drive in sizes of from 3 to 60 hp.

Fan Outfits.—Wagner Electric Mfg. Company, St. Louis, Mo. Bulletin No. 76. Refers to single-phase variable speed ventilating fan outfits which are suitable for office, bank and store rooms, laundries, hotel and restaurant kitchens, engine-holler and dynamo rooms, and any other place where ventilation is desired.

Water and Steam Regulators.—Williams Gauge Company, Pittsburgh, Pa. Pamphlet. Pertains to the Williams automatic safety feed water regulator, auxiliary feed water regulator, steam pump governor, steam operated trap, rotating regrinding gauge cocks, and quick action chain lever water gauge.

Valves.—Golden-Anderson Valve Specialty Company, Fulton Building, Pittsburgh, Pa. Catalogue No. 8. Size 5½ x 8 in.; pages 56. Gives an illustrated description of the Anderson cushioned nonreturn valves, reducing valves, patented cushioned check and hand stop valves, patented balanced plug cocks, balanced plug locomotive blow-off valves, automatic and counter-balanced valves, automatic standpipes, flexible spout standpipes, patented automatic track float valves, patented altitude valves, ideal strainers and fish traps, the Golden Clean Seat valves, Clean Seat blow-off valves, patented high and low pressure tilting steam traps, and the Golden Gate valves. The Golden tilting steam trap, the Anderson automatic float valve and the Anderson cushioned nonreturn valve were illustrated and described in the issues of *The Iron Age* of September 20, 1906, October 4, 1906, and April 25, 1907, respectively.

Machinery.—Queen City Punch & Shear Company, Cincinnati, Ohio. Loose leaf catalogue. Deals with punching and shearing machines, which are designed to do all kinds of ordinary punching and shearing and are made single and double in form, with throats any depth between 7 and 30 in. Bending and straightening rolls are also dealt with.

Hoists, &c.—Wallace-Lindesmith Hoist Company, 2903 Central avenue, Los Angeles, Cal. Catalogue. Descriptive of the Wallace lumber and concrete hoists, single and double drum friction hoist, electric hoist, gasoline hoist, steam engines and boilers, concrete mixers, and concrete carts.

Steel.—Crucible Steel Company of America, Howe, Brown & Co., Ltd. Works, Pittsburgh, Pa. Pamphlet. Lists the company's various kinds of steels, giving weights, prices and sizes.

Ore Values.—Traylor Engineering Company, 2 Reetor street, New York. Calendar and data sheet No. 10. Size 6 x 9 in. This hanger carries a calendar for October and calls attention to the company's business—designing and manufacturing mining and metallurgical machinery, furnishing plans and specifications and all material for building and installing machinery, making a specialty of contracts for completed plants. The reverse side of the card contains a table giving the metallic value of 60 different ores, including the composition and specific gravity of each and the per cent. of metal contained.

Feed-Water Heaters.—Warren Webster & Co., Camden, N. J. Pamphlet. Devoted to the Webster Star vacuum feed-water heater and purifier, and points out the saving claimed to be effected by its use. Some illustrations are included. A blotter pertains to the Webster system of steam circulation for heating purposes, feed-water heaters and purifiers, and steam and oil separators.

Oil Fuel Burner.—Continental Oil Burner Company, Seattle, Wash. Pamphlet. Relates to the use of oil for fuel purposes, with special reference to its atomization by compressed air instead of steam. Incidentally some facts concerning the relative cost and efficiency of oil as compared with coal are given, together with a comparative table showing the cost and efficiency of a ton of coal as against that of a barrel of oil. Following a description of the Continental oil burner and the necessary equipment for its operation a number of claims as to its effectiveness and economical operation are stated.

Steel Factory Fixtures.—Federal Steel Fixture Company, Chicago. Pamphlet catalogue. Describes steel factory fixtures, including shelving, box racks, tote boxes and other steel specialties. To supplement fireproof precautions in modern factory buildings, the company supplies steel furniture and fixtures throughout for both office and factory use. Tool racks and foremen and shop benches, made entirely of steel, form a part of this line, together with a wide variety of clothes lockers.

Rail Spikes and Plates.—Dillworth, Porter & Co., Ltd., Pittsburgh, Pa. Pamphlet. Contrasts the Goldie steel rail spike with common iron spikes and describes the Glendon longitudinal flange tie plate, Goldie claw tie plate, Goldie guard rail plate and brace, and crossing, boat and dock spikes, and the Goldie patented perfect railroad spike.

HARDWARE

THERE is no doubt that parcels post will be a prominent subject for discussion at the coming session of Congress, and that the Post Office Department will recommend action looking to the carrying of merchandise in the mails on a greatly increased scale. The advocates of a system of parcels post represent widely different tendencies. On the one side there is a conservative and reasonable desire to improve the public service, giving increased facilities for the carriage of packages in the mails, and using the machinery of the Post Office Department for the convenience of the people generally. Those looking at the matter in this way recognize the limitations which should be observed in efforts in this direction and are disposed to move conservatively, recognizing the peril that attends an intrusion by the Government on the proper field of individual enterprise, and also fearing the great and indefinite expense which will probably be involved.

There is on the other hand a radical and perhaps populist spirit manifest in the advocacy of the establishment of a system for the carrying of merchandise in the mails. The disposition is to do great things in the line of parcels post, without much regard to the cost or to the danger which may reasonably be apprehended from the Government's building up and controlling such a colossal system of distribution. This spirit is noticeable in the work of the Postal Progress League, with which many men of standing are identified, probably attracted by its plausible name—for is not everyone in favor of postal progress? This organization, however, seems to be working along lines so radical that it would appear that its efforts are left in the hands of a few extremists, whose utterances do not represent the matured judgment of the membership. An illustration of this is given in some of their recent deliverances, referred to in the interesting letter of our Washington correspondent, which will be found on another page. It will there be seen that the League in an official utterance, leaving the matter of postal development, makes a pronouncement not only in favor of the Government's taking charge of the whole business of public transportation, guaranteeing to the holders of transportation securities a fair return on their investment, but, going much farther than this, favors the maintenance and extensions of post routes in all parts of the country, with an engineering corps and a body of employees regularly enlisted. The whole business of the transportation of the country would thus be in the hands of the Government. This would be simply the fuller development of the principles which such extremists are following in their advocacy of a parcels, or more correctly, of a merchandise post. The disguise of populism is thus thrown off.

The whole subject of a parcels post has for some time been under careful consideration by the postal authorities and the recommendations of the Postmaster General will unquestionably have great influence with Congress. The weight which belongs to an official recommendation will in this case be enhanced by the broad and businesslike views of the head of the department. Whatever difference of opinion there may be as to the practicability and wisdom of the plan to be proposed there will be a general recognition of the ability and good judgment which are characterizing his administration.

He certainly has not been captured by the extremists on this subject, and the indications are that his recommendations will be along conservative lines. Whether or not they will stand the test of the close scrutiny to which they will be subjected remains to be seen.

Judging by utterances of Postmaster-General Meyer his plan for this department of postal service involves two principal features: First, the reduction of the charge for carrying merchandise from 16 cents per pound, as at present, to 12 cents per pound, and increasing the maximum weight from 4 lb. to 11 lb. A more radical change, which indeed involves a decided innovation on the former practice of the department, is to be in connection with the rural free delivery. The plan contemplates the carriage of merchandise on rural routes at 5 cents for the first pound and 2 cents for each additional pound up to 11 lb., or 25 cents for a package weighing 11 lb. This feature of the plan of the department is referred to by the Postmaster General as giving local merchants the advantage to which they are entitled over the distant catalogue houses, inasmuch as these mail order houses will be obliged in using the mails for the carriage of their goods to get the goods first to the starting point of the rural route and then pay the further charge for delivery to their customers on such rural route. Thus, a 10-lb. package, mailed from a catalogue house to its customer in the country, will, under the projected scheme, cost \$1.20 postage to get it to the starting point of the rural route and an additional 23 cents to cover its carriage on the rural route. The local merchant on the other hand residing at the starting point of the route will be subjected only to the latter charge of 23 cents on a similar package. It is gratifying to note that the Postmaster General recognizes the supreme interest of the local retail merchants in this matter and favors a plan which, in his judgment, will give them adequate protection—indeed, in his opinion, putting them in a most advantageous position in their competition with the great catalogue houses. The subject is, however, many sided, and objections to the project, even in the form in which it is broached, will suggest themselves to those who have given the subject careful consideration.

The duty of the Hardware trade or of any other special interest is obvious: First, to take a broad and reasonable view of the whole subject and of any plan which may be proposed, being careful to avoid captious and narrow minded opposition. If as public spirited citizens there is in their judgment ground for opposing any given form of parcels post they should use their influence in every legitimate way, and especially on their Representatives in Washington, to defeat or adequately amend the proposed legislation. There should, however, at the same time be a readiness to avail themselves of the opportunities now given, and probably to be given in larger measure in the near future, for the carriage of merchandise in the mails. The permission to rural carriers to do an express business on their own account, as referred to in our last issue, gives an opening for enterprise and outreaching on the part of local merchants which should not be neglected. If the plans of the department for a merchandise post on the rural routes should meet the approval of Congress, merchants should make their plans for the aggressive maintenance of their

position as distributors in their own territories and for the extension of their business by means especially of the facilities thus afforded. Any merchant who fails to do this will be likely to find that others will avail themselves of the exceptional facilities thus provided, and that their goods and not his will be distributed to customers who legitimately belong to him. We repeat that there is call for prompt and energetic action along productive lines and not simply in the way of criticism and protest.

Condition of Trade.

As of general interest, especially at this time when manufacturers and merchants large and small are carefully studying trade conditions and tendencies, we give in the following columns extracts from letters received from representative Hardware merchants in which the business situation in their territories is reflected. These advices come from the Central West and the near Northwest. While the situation in other sections of the country will doubtless, on account of local conditions vary somewhat from those represented in the letters, these accurate and detailed reports from responsible merchants in direct contact with the trade situation in the very important section covered by our correspondents, including as it does great agricultural and manufacturing communities with nearly 40 per cent. of the population of the entire country, are certainly of exceptional interest and will justify careful perusal. It is gratifying to note that the conditions thus depicted are on the whole decidedly satisfactory, indicating but little let-up in building and other enterprises and a general confidence that the volume of business for the remainder of the year will be good. With this there is evidence of the development of a cautious disposition and a creditable conservatism on the part of merchants.

Chicago.

Merchants, especially those in the jobbing trade, who are now confronted with the necessity of placing orders for spring goods are carefully scrutinizing the trend of affairs in an effort to properly gauge their purchases to fit the requirements of the future. Conflicting currents that characterize commercial movements at the present time render solution of the problem more than ordinarily difficult. As against a fairly bountiful harvest with accompanying high prices for its products, on the one hand, are the disturbing effects of an unsatisfactory monetary condition, which has unfavorably affected important transportation and industrial interests and to some extent curtailed demand. The trade of last year was of too phenomenal proportions to form a safe criterion for future operations, and under the circumstance it is therefore not surprising to find buyers acting with conservative caution. Retail dealers are buying more sparingly of goods for future delivery, but this is doubtless due in a large measure to the knowledge that with a return to more normal conditions of supply and demand stocks can be replenished on comparatively short notice. The speculative element, which often augments purchases, is entirely eliminated, and in this respect business is on a sounder, firmer basis. Current orders, which are largely for present needs, continue in good volume. Prices in the main hold firm, though here and there some recession is noted, especially on lines closely related to the non-ferrous metals. A better supply of Galvanized Sheets has resulted in easier prices from jobbers' stocks. No. 28 Galvanized can now be had at a concession of \$1 a ton from the price of \$4.15 heretofore ruling. Light Black Sheets hold firm, but on the heavier gauges of Blue Annealed store quotations are off about \$2 a ton, \$2.30 being asked for No. 10. There seems to be a general desire on the

part of the trade to restrict stocks of Wire Cloth to one color as far as possible, and it is likely that manufacturers will in consequence very largely reduce their output of green cloth for the coming season, furnishing black instead wherever practicable. Duplication of stocks will to a large extent be thus avoided, as the dealer will not find it necessary to carry the same sizes in both black and green.

Philadelphia.

SUPPLEE HARDWARE COMPANY.—Business conditions since our last letter show no evidence of a decline. The demand for general lines continues in good volume, and we can see nothing to indicate a material or noticeable falling off in the wants of the country at large. We feel greatly pleased with the trade thus far for 1907, our own experience being an increase in general volume of business from month to month, and prospects, according to reports from our representatives, seem good for the balance of the year. For the nine months ending September 30 building operations in our city exceeded in the amount invested any corresponding nine months for years, and contemplated work is largely in excess.

Notwithstanding indications are apparently unchanged and demand but little diminished, we think a spirit of conservatism is being manifested throughout the country, which speaks well for the foresight of the merchant trade of the land. We know from the natural conditions of things that all years cannot be as prosperous as 1905, 1906 and 1907, and an honest and careful scrutiny as to what the Presidential year (1908) is likely to bring forth is, in a measure, an unknown quantity, and while we hope that trade may continue unchanged, yet we feel it good business policy to be in condition to discount any dark cloud that might obscure the business horizon.

We do not feel at all pessimistic regarding present conditions or those likely for the future, our only feeling being one that would suggest somewhat more conservative views.

Baltimore.

CARLIN & FULTON.—So far the depressed condition of the stock market, with which the financial columns of the press are full, has not been reflected in the legitimate or actual business of the country, by which terms we would describe the manufacture and the distribution of merchandise required by the every day necessities of an immense and growing population. The same terms apply also to the gathering and the transportation of the immense products of agriculture, and to the marketing of the ore and coal dug from the mines all over the land, all of which is *bona fide* business in that it produces or deals in actual commodities of intrinsic value, and represents the exchange between individuals, and sections, and nations, of what is tangible or real as contrasted with that great volume of speculation carried on in the stock exchanges of the great cities, which produces nothing and adds nothing to the material prosperity of the country.

As long as there is a world wide demand at high prices for the immense crops of wheat and corn and cotton with which this nation has again been favored, the plain, every day people who have produced what they sell can feel happy and contented with their blessings regardless of the crumbling values of stocks, inflated when issued and depreciated through the manipulation of what is termed a bear market.

In some of the financial journals we read that as the investment market has almost disappeared and the business of the stock brokers almost gone for lack of buyers, there must be a recession in commercial activity; or, in other words, that legitimate, honorable and useful business must be held up to give the stock market a chance, forgetful that stocks without dividends are those without value, and that dividends depend upon earnings and they upon business activity.

The published statements of nearly every bank and banking institution in the United States show larger deposits than have ever been known. The bank clearings in all the cities were never greater than they are to-day. The railroads are carrying now as large a tonnage as ever in their history, and so trade goes on from day to day, excepting that the doubtful enterprises, the schemes

of visionary dreamers or promoters, cannot be floated upon an innocent, unsuspecting public as easily as they were a few years ago.

Conservatism in manufacturing and in buying has been the rule, and still continues to be on the part of the mercantile interests throughout the country. It has been in the power of the United States Steel Corporation at any time almost with the last few years to put prices on its products far beyond the figures obtained, but in the exercise of the very best discretion and judgment it has held prices within reason, and even were times to become dull the decline, if any, in their products would be very small and injure no one to any extent worthy of consideration. This, however, has not been the policy of the producers of copper, and to-day's market shows the folly of exaggerated values of any commodity.

Cleveland.

THE W. BINGHAM COMPANY.—A good, steady volume of business in all lines of Hardware is coming to this market direct by mail and through salesmen. Orders are well assorted, and the demand is not only for seasonable goods, but for the general line, indicating that country merchants have been busy in all lines of goods and their stocks are depleted. Many orders are also being placed for goods to be shipped next season—that is, after the first of January.

The manufacturers of steel goods, such as Hoes, Forks and Rakes, also Ice Cream Freezers, have issued their prices for next season's shipment and orders will soon be booked on these lines. Fence Wire and Nails are in good demand. Prices are firm.

Many new orders are now being placed for holiday goods, such as Chafing Dishes, Ice Skates, Sleds and Cutlery, Scissors, Shears, Razors and Pocket Knives, also American and foreign Coffee Making Machines. As these goods are mostly sold from samples, salesmen who carry and show up their line of samples are capturing a great many orders.

There is a good demand for White, Blue and Gray Enamelled Ware, high grade of Tin and Japanned Ware, also fancy Tea and Coffee Pots and Cast and Spun Aluminum Ware.

Collections are quite satisfactory, as merchants for the most part are taking advantage of the cash discount and remitting promptly.

Omaha.

LEE-GLASS-ANDRESEN HARDWARE COMPANY.—Trade conditions throughout the corn belt east and west of the Missouri River continue very satisfactory. Business keeps up remarkably well, with a full head of steam on and making Lusitania time. All kinds of goods are going into consumption freely. This is the result of fair average crops, coupled with remunerative prices. Prices as a rule are firmly held, as there appears to be business enough for all. With the exception of Copper and Brass Goods, Solder and a few minor items, the market remains in a normal condition. The above conditions will probably continue throughout this Western country for the remainder of the year at least.

New Orleans.

WOODWARD, WIGHT & Co.—Business conditions during October so far have been on about a normal scale for this time of the year, which means that they have been very good, as October is one of the busiest months in the year in the Hardware and Mill Supply lines in this section, particularly among the sugar mills.

The weather has been ideal for the sugar crop, and conditions with the sugar planters are better than they have been for several years. We have had so much moisture and hot weather that the cane has grown very rapidly, and several days of fairly cool weather, such as we are now having, will put it in excellent shape for grinding.

The lumber mills, however, are not as busy as they were this time last year, as the demand from car building plants and the railroads has fallen off to practically nothing, with the result that many of the small mills which get out railroad and bridge timbers, car sills, &c.,

are shutting down for want of orders. The larger plants that operate in this class of material, as well as flooring, ceiling, siding and general building construction lumber, are having a moderate trade. A resumption of buying on the parts of many of the railroads and car companies must soon come, and when it does business in this line will improve materially.

Weather and other conditions pertaining to the cotton crop have been all that could be desired, and the early bad reports, due to a late start, are being gradually overcome. The crop is coming to market as fast as labor conditions will permit, and with present prices and normal conditions for the next 30 days the cotton planter is going to get a handsome return for his crop.

Business conditions in New Orleans, particularly among the shipping, have been very poor for some weeks, due to two extensive strikes, among the longshoremen at one time and now among the cotton screwmen and all other labor unions on the entire river front, with the result that exports and imports for the last few weeks have fallen off very heavily. As this latter strike affects the railroads as well as the steamship people, there has been a great deal of annoyance to all merchants in shipping and receiving goods even to interior points. Steamship and railroad people have apparently determined to win out, as there are any quantity of laborers being brought in by the larger systems, and while there has been some improvement in the last few days, matters have not reached anything like normal conditions. It will take a few weeks, even after the strike is over, to get back to a smooth movement, but as this is the heaviest shipping time of the year it may mean a serious delay to all parties for even some time beyond this.

Collections, due to these delays and also to monetary conditions, are not as good as they have been, but after commodities have an opportunity to move without unusual delays we look for better results.

Louisville.

BELKNAP HARDWARE & MFG. COMPANY.—The market is in a most anomalous condition. There seems to be a good demand for all kinds of goods, yet we hear of curtailments in many quarters. The railroads in the South announce laying off large numbers of men, both laboring and office force, yet the railroads on the tracks are as busy as they can be. There has rarely been a time, if ever, when sentiment seemed bound to assert itself as strongly as at present. People insist that the time has come for a reduction of prices, therefore, reduce prices whether the actual natural forces at play count for anything or not.

In the case of iron and steel mill products, at least many writers and would-be philosophers seem to overlook the fact that when the price of billets and other raw material advanced, there was no such proportionate advance on bars, sheets, &c. If it still be true, as the poet tells us, that "He who is down need fear no fall," we are loath to believe that manufactured product in its higher forms can suffer much. There is room for shrinkage in billets, rails and the coarser forms which have been forced up during a period of urgent demand, so that possibly some news is due to arrive on that score of lower figures, and the man with a scrap pile in the corner of his shop is sorry he did not sell it some months ago.

Money continues very tight, owing to inability to realize on the large quantity of new securities which were uttered during the past year and the first few months of this. We have never had quite such a heavy case of "financial indigestion," if we know anything about it at all. If we only had the stomach of an ox and could reverse the swallowing process and put it through a second mastication, or purgatory, or some shape, or whatever the repentant process might be, possibly we could get it in more assimilable form and not feel obliged to take so much medicine.

Collections are fair. A number of country banks are being opened, so that two banks have been made to grow where one grew before. Whether that may be styled progress always, we are unable to say, but it shows where some of the money is at least. Whether it makes

the sixpence more nimble, so that it can pay off an increased number of debts to have so many places which our friends, the Germans, might designate as "Halt-stelle," the deponent saith not; but if we get through this fall crop moving period, which seems destined to bring such nightmares, it should never occur again. Surely our financiers and legislators are capable of devising some better method than this of putting us all in the hole once a year, so that we are in doubt whether it means wealth and prosperity to us to have big crops or not. We ought to learn something from our friends, the Canadians, who claim to have a currency which is elastic all the year round and available at just the right branch bank at any given time. Possibly it is only rumor that makes us think they do things better in France. We do know that they might be better with us.

St. Louis.

NORVELL-SHAPLEIGH HARDWARE COMPANY.—As exclusively predicted in *The Iron Age*, President Roosevelt arrived in St. Louis looking like Neptune. As he landed from the steamer Mississippi the rain was pouring in torrents. He insisted, however, in driving in an open carriage. He said the people had come to see him and he would not disappoint them. One gentleman who, like a prominent Southern Hardware jobber, is thoroughly grounded in the classics, remarked that he looked like Jupiter Pluvius. Someone else answered, "No, he looks to me like Jupiter E Pluribus."

Well, we gave the President a good time, and sent him away with another steamer following all set for a banquet. When the time came the dining steamer hailed the President's boat, the two were lashed together and the President came over for supper. This boat, arranged as a diner, was a little surprise gotten up by the Business Men's League of St. Louis, and the president of the Business Men's League, J. E. Smith, happens to be a first-class Hardware man. So you see, they can't lose us.

Trade continues in very satisfactory volume, but collections in certain parts of the South are somewhat slow.

In discussing crop conditions with a prominent cotton merchant of this city, he said some things which we believe will be interesting, especially in parts of the country where the trade is not familiar with the cotton plant.

Cotton is a sun worshiper. It thrives on sunshine and dry weather. This year cotton has given the country one of the surprises it often keeps up its sleeve. On June 20, on account of cold, wet and unfavorable weather, the cotton growers were despairing of even a fair crop. Then in July and August there was ideal cotton growing weather—plenty of sunshine and warmth. Cotton got busy, and in those two months recovered three weeks' lost time.

Cotton grows in the form of a bush. The limbs on the lower part of the bush are put out first, then comes what is known as the cotton square and later the cotton bolle. The lower part of the bush develops cotton first. This is called the "bottom crop." Later cotton develops on the middle limbs of the bush, and this is called the "middle crop." Last of all cotton develops on the top of the bush, and this is called the "top crop." Many people who are not familiar with the growing of cotton mistake "bottom cotton" for cotton grown on bottom lands and "top cotton" for cotton grown on high lands, which is an error. And "middle cotton" on the bush does not mean middling cotton. Middling cotton is the standard or average of the cotton crop, just as No. 2 wheat is the average of the wheat crop. Whatever is above middling goes into the finer grades, and whatever is under middling is of a lower average of quality.

Being a sun plant, cotton on high lands develops before cotton in the low lands. The high land bush is usually quite small, being from 18 to 24 in. high, while the cotton plant in the low lands grows very high, and in what are known as "strong lands," sometimes as high as 10 or 12 ft. Cotton on the high lands is often "made" before cotton in the low lands. Naturally such a large bush shades the cotton from the sun and it develops more slowly. Therefore an early frost may not damage high land cotton, while it may cut short the low land crop. A cotton field is picked over and over again as cotton develops.

Frost is always feared by cotton growers because cotton will continue to mature and develop until frost comes. Frost always stains cotton. Strange to say, a sharp frost followed by clear, dry weather often stimulates the cotton crop and gives it a longer fiber, but a sharp frost followed by wet weather causes the bolle to be mushy and seriously affects the quality of the crop.

This year unusual conditions have prevailed in the cotton market. There have been general predictions of a short crop. Unions have been formed among planters and they have been holding back their crop for higher prices. This has prevented much of the early cotton going to market. The planters claim even the present prices are too low. On the other hand, it would seem the spinners are taking the other side of the argument; they claim the present prices are too high and are not buying cotton. Therefore the cotton business this year is very late. The planter is making his bank and his merchant wait until he gets ready to sell. This has delayed payment of the merchants' bills and is also delaying the return of money to the financial centers as the result of the usual sale of the cotton crop at this time of the year.

Now here a curious natural factor takes part in the situation: If we should within the next few days have a hard, sharp, killing frost throughout the South the growth of cotton would be stopped, the crop would be curtailed and prices undoubtedly would advance. The spinners would probably lose their nerve and immediately start buying. In that case the planters would win; they would get the higher prices for which they are waiting. On the other hand, if the weather remains warm, the sun shines and we have no frost cotton will continue to grow, there will be a very much heavier crop than expected. This will naturally depress prices and in that case the spinners will win.

Therefore, this year we have the unusual spectacle of the spinners waiting for lower prices on one side and the planters holding for higher prices on the other, with King Frost as the deciding factor in the game.

We are told the largest crop of cotton was 13,900,000 bales. That year frost was very late, and bottom, middle and top crops were made all over the cotton section. It is expected by the best authorities that the cotton crop this year will be fully 12,500,000 bales. If this is true the cotton crop this year will be a bumper one, and if the planters can realize anything like the present high prices general prosperity should reign throughout all parts of the South where cotton is raised.

In considering the actions of the cotton growers' unions in holding their cotton for higher prices regardless of their obligations to merchants and to banks, we cannot help but wonder why the Legislatures of some of the Southern States, which have been so radical in attacking foreign trusts and combinations, are not taking up the question of restraint of trade with some of these cotton growers' unions.

Boston.

BIGELOW & DOWSE COMPANY.—The equinoctial storm this year lasted longer, was more severe and brought such floods of rain and varying weather that it seemed to be in league with the stock market in trying to help the bears and raised Cain generally. Such trying conditions made every one blue and uncomfortable, and had its effect on sales of all kinds of merchandise while it lasted. With the advent of clear, bright, cool October weather there is new life in trade and sales are again running ahead of last year.

Prices remain firm, except on goods where copper is the principal cost, while copper and brass goods remain unchanged where labor is the prominent factor. The scarcity of skilled workmen and the high wage they demand insures against any heavy declines in factory costs. The high prices demanded for farm products increases the cost of living and serves to maintain the present scale of wages.

All acknowledge the necessity of conservative buying, not only for the general belief in lower prices in the future, but on account of the present financial condition, which is being exploited so much in the papers that one is almost a believer, notwithstanding his own

business is in larger volume and his collections are above the usual average.

Sentiment is all right, but it is not yet time to place the Hardware business of the country on the basis of stock gambling and frenzied finance. Conditions are different and it is fair to believe Hardwaremen are gifted with a good bit of reason and are not borrowing trouble. All believe that the coming convention at Atlantic City next week will do much to settle the minds of the dealers and manufacturers as to their policies for the coming year.

NOTES ON PRICES.

Wire Nails.—There is a very satisfactory demand for Wire Nails and manufacturers are fully occupied in filling specifications on contracts of which they have still many uncompleted, and in taking care of such new business as comes in to them. There is a free movement of Nails required for use in buildings now under way, and the character of the demand indicates but little let up in buildings generally. Reports, however, show that there is more conservatism in this department of enterprise than there has been for some time, on account apparently of the high cost of materials and labor. Throughout the country the influence of financial stringency is felt to some extent, and this has influence in restraining enterprise. The people at large, however, are evidently enjoying ample prosperity, and in the agricultural sections there is still a good deal of building under way or in prospect. The market is firm and prices well maintained. Quotations are as follows, f.o.b. Pittsburgh, plus actual freight to point of delivery, 60 days, or 2 per cent. discount for cash in 10 days:

Carloads, to jobbers.....	\$2.05
Carload lots, to retail merchants.....	2.10

New York.—The local market is somewhat quiet, as far as demand is concerned, purchases being only for immediate requirements. Local jobbers and Nail houses are holding small lots at store at \$2.35 base, and in general this price is fairly well maintained.

Chicago.—The effects of continued heavy shipments are beginning to show in jobbers' stocks, which are somewhat improved. Less difficulty is experienced in keeping a complete assortment of sizes. In addition to a considerable volume of new business specifications against contracts are coming in without stint. Prices continue to hold firm. Quotations are as follows: \$2.23 in car lots to jobbers, and \$2.28 in car lots to retailers, with an advance of 5 cents for less than car lots from mills.

Pittsburgh.—The present condition of the Wire Nail trade is referred to by the manufacturers as being extremely satisfactory, new demand being fairly large and specifications against old contracts are being received in good volume. We are advised that present prices are being firmly held and there is an entire absence of any cutting. The supply of Steel and of cars is ample and shipments by the mills are heavy. It is confidently believed by the manufacturers that present active conditions in the Wire Nail trade will be maintained for a considerable time ahead. Quotations are as follows, f.o.b. Pittsburgh, plus actual freight to point of delivery, 60 days, or 2 per cent. discount for cash in 10 days:

Carloads, to jobbers.....	\$2.05
Carload lots, to retail merchants.....	2.10

Cut Nails.—Cut Nails, which did not advance with the last advance in Wire Nails, are moving in fair but not especially heavy volume. The mills report something of a falling off in new business in carload lots, but are receiving many less than carload orders. It is evident that the jobbers are not ordering as liberally this month as they did in October a year ago. Merchants throughout the country, while apparently enjoying a good business, are actuated by a much more conservative spirit and are avoiding undue accumulation of goods. This disposition leads them to order in considerably smaller quantities than last year, but the aggregate of their orders is large, and it seems likely that the mills will be fully occupied for some time to come. The market continues to be represented by the quotation of \$2.10, with freight

added, from Pittsburgh, but this price is not in all cases strictly maintained, slight concessions being sometimes given on the base price or in the amount added to cover freight.

New York.—A comparatively light demand characterizes the local market. Quotations for small lots at store range from \$2.30 to \$2.35 base, the former price being more or less general.

Chicago.—The demand is not especially active, but is on the whole satisfactory in this market. Mill prices are reported to be occasionally shaded, but from jobbers' stocks prices are well maintained. Quotations are as follows: Iron Cut Nails, carloads, to jobbers, \$2.38; to retailers, \$2.43; Steel, to jobbers, in carloads, \$2.28; to retailers, \$2.33.

Pittsburgh.—New business in Cut Nails is small, buyers placing orders only for current needs and only in small lots. There is considerable unevenness in prices of Cut Nails, and the general tone of the market is weak. Specifications are not being received at a very satisfactory rate and some tonnage has been held up. We quote Steel Cut Nails at \$2.05 to \$2.10 in carloads, and \$2.15 to \$2.20 in less than carloads. The market is only fairly strong at these prices. Iron Cut Nails usually bring 10c. a keg advance over above prices.

Barb Wire.—The substitution of Woven Fencing for Barb Wire is influencing very considerably the demand for the latter commodity. There is, however, a large though perhaps diminishing sale for it, and the mills are well occupied on contracts. New business at the present time is not as heavy as a year ago, and it is noticeable that many of the orders are for smaller quantities, indicating a conservative spirit on the part of merchants. The market is, however, firm, and quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

	Painted.	Gal.
Jobbers, carload lots.....	\$2.20	\$2.50
Retailers, carload lots.....	2.25	2.55
Retailers, less than carload lots.....	2.35	2.65

Chicago.—Conditions remain unchanged. Shipments against contracts constitute the bulk of the business, new business forming a small part of the total. Prices are firmly maintained. We quote as follows: Jobbers, Chicago, car lots, Painted, \$2.38; Galvanized, \$2.68; to retailers, car lots, Painted, \$2.43; Galvanized, \$2.73; retailers, less than car lots, Painted, \$2.55; Galvanized, \$2.85; Staples, Bright, in car lots, \$2.35; Galvanized, \$2.65; car lots, to retailers, 10 cents extra, with an additional 5 cents for less than car lots.

Pittsburgh.—Shipments now going out by the mills are mostly specifications against old contracts, and only a fair amount of new business is being placed. Woven Fence Wire is displacing Barb Wire to some extent, which will explain the falling off in tonnage on the latter and the present active demand for the former. Shipments of Barb Wire to Southern points are reported as heavier than to other consuming territory. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

	Painted.	Gal.
Jobbers, carload lots.....	\$2.20	\$2.50
Retailers, carload lots.....	2.25	2.55
Retailers, less than carload lots.....	2.35	2.65

Smooth Fence Wire.—There continues to be a decidedly satisfactory demand for Smooth Fence Wire, heavy orders coming from manufacturers of Woven Fencing. Prices are generally firmly maintained. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. for cash in 10 days:

Jobbers, carloads.....	\$1.90
Retailers, carloads.....	1.95

Chicago.—Fence manufacturers continue to supply an unabated demand, and are freely furnishing specifications against contract. Despite the heavy shipments constantly going forward from the mills there is still an urgent demand for prompt service. Quotations are as follows: In car lots, to jobbers, \$2.08, f.o.b. Chicago, and to retailers, \$2.15.

Pittsburgh.—A fairly heavy volume of new business is being placed in Fence Wire, and shipments by the

mills on this new business and also against new contracts are heavy. Buyers placing contracts are urging prompt shipments by the mills, indicating that stocks of Fence Wire are light. The market is firm, and we are advised that official prices are being held absolutely. Quotations for base numbers 6 to 9 are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

Jobbers, carloads.....\$1.90
Retailers, carloads.....1.95

Leather Belting.—The market for Leather Belting is firm and characterized by a healthful tone. There is as usual a willingness to make low prices in competition for large and extremely desirable business, but on the whole quotations show a tendency to stiffness, although of course governed to a considerable extent by quality. The market may be represented in a general way by a discount on first grade, but not extra standard Belt of 70 per cent., beyond which there are moderate concessions for quantity and to contract buyers. October is normally a big month with Belting manufacturers, and this year it will be no exception, an excellent demand being uniformly reported. Hides of good quality are coming into the market, and butts seem to have recovered from the slight decline which took place in the summer. Those who sell much of their product to the manufacturing consumer state that orders from large users are fully up to last year, although somewhat more conservatism as to their requirements is evidenced by smaller factories of more limited resources. Those who sell the Hardware and supply trade state that jobbers are not scaling down their stocks to any considerable extent, as the price of Belting is not regarded as high, and it is thought probable that a steady market may be expected for some time to come.

Belt Lacing.—The same conditions referred to under the head of Leather Belting are observed in the market for Belt Lacing. On the whole, however, prices on Lace are not quite so firm. The market on Sides may be represented in a general way by a quotation to fair trade of 24½ cents per square foot, and on Cut Lace by a discount of 40 and 10 per cent.

Spooled Wire.—Prices on Spooled Wire show a declining tendency, reductions being, of course, most noticeable on Brass and Copper lines. The market to the retail trade may be represented by a discount on Tinned and Annealed of 70 and 10 per cent. and on Brass and Copper, 60 and 10 per cent.

Steel Goods.—Now that next season's prices on Steel Goods have been announced, the market has assumed an active appearance and contracts are being earnestly solicited. Noticeable aggressiveness is being shown by the Independent manufacturers, and it is even reported that slight concessions in one form or another have been made on desirable business. Some Steel Goods manufacturers are quoting low prices on Scythe Snaths and Cradles and jobbers are offered the opportunity to have their shipments of these lines come together, thus accomplishing a considerable saving in freight. Generally speaking, the market is characterized by a healthful tone and the volume of business booked promises to be excellent and will probably tax the capacity of some of the manufacturers.

Copper Kettles, Wash Boilers, Etc.—Steadily lower prices are being quoted on Copper Tea Kettles, Pots, Wash Boilers, &c., on account of the continued decline in the metal market.

Sheathing Paper.—An advancing tendency is observed in the market for Rosin Sized Sheathing Paper, quotations of leading manufacturers ranging from \$2 to \$4 per ton higher than a few months ago. In explanation the manufacturers state that they are being compelled to pay much higher prices for the stock of which their product is made. This is the busy time of the year in this line, and buyers are giving the market especial attention in the effort to place contracts on a favorable basis.

Cast Iron Soil Pipe.—As recently reported in these columns, the market for Cast Iron Soil Pipe is characterized by irregularity and weakness, and is now in a

somewhat demoralized condition. Many manufacturers admit that there is an overproduction which cannot be marketed except at the expense of prices. Although jobbers are buying lightly, apparently fearing that the market will go still lower, they are able to purchase at almost their own figures, which are certainly not far from the cost of the largest producers, and doubtless represent an actual loss to smaller makers. The weakening of the Iron market is of course a factor in the present unsettled situation. While quotations are very irregular, depending a good deal on location of mill, the following discounts may be mentioned without touching the extreme prices to large buyers: Standard Pipe, 2-6 in., 60 and 10 per cent.; extra heavy, 2-6 in., 70 and 10 per cent.; Fittings, 75 and 10 per cent.

Sand Paper.—Satisfactory conditions are now said to be ruling in the Sand Paper market, business being in good volume and prices being, as a rule, fairly well maintained. As usual so-called outside manufacturers are quoting a little under the brands whose market position has been longer established, but irregularity arising from such concessions is probably not as great as a few months ago.

Coil Chain.—It would appear that some manufacturers of Proof Coil Chain accepted contracts rather freely during the recent period of irregularity in this market. Selling agents report that it is now difficult to get business at the prevailing prices, and it is inferred that many large buyers are being supplied on contracts entered during the period referred to. Attention is also called to the fact that new competition is entering the market.

Copper Products.—There is little to add to recent reports on manufactured material based on Copper. Buyers are still indifferent and base prices unstable, according to the temperament or conditions of sellers and buyers. Orders for Copper Sheets at 18 cents, base, instead of the nominal 20 cents, base, can be placed. Further developments in price schedules are hinted at as liable to occur early next month. The trade is supplying only actual wants.

Shot Guns.—Leading manufacturers of Firearms, acting in harmony, have made an advance on their corresponding lines of cheap single barrel Shot Guns amounting to 50 cents per piece. The market to good buyers of Sporting Goods may be represented by a quotation of \$4 to \$4.25 each.

Window Glass.—At a meeting of representatives of Glass manufacturers and of the Amalgamated Window Glass Workers, held last week to discuss the wage scale, nothing definite was accomplished, according to reports. It is understood that the manufacturers proposed to the workers a reduction of 35 per cent. on single and 45 per cent. on double strength Glass, from last year's wage scale. A proposition was then submitted by the workers of a 12½ per cent. reduction from the recently issued scale and the starting of factories pending the formulation of a sliding scale. This proposition was not acceptable to the manufacturers, but they expressed their willingness to start their factories at a reduction of 25 per cent. from last year's scale, pending the formulation of a sliding scale. It is understood that the workmen declined to consider this offer. With the views of the committees so far apart it seems as if considerable time would elapse before an agreement could be reached. The competition of machine blown Glass is a factor the manufacturers have to take into consideration in deciding what wage scale they can afford to pay. Before cold weather sets in an increase of business is anticipated, by some jobbers, as a result of the closing in of new buildings. Prices recently adopted by jobbers at this point are as follows: Single strength 90 and 10 per cent. discount, double strength 90 and 20 per cent. discount. These discounts apply to purchases up to 50 boxes. Over 50 boxes the prices are 5 per cent. better. The occasion for the advance in prices, it is explained, is that there is no immediate prospect of Glass factories getting to work, that stocks in manufacturers' hands are becoming depleted and some sizes scarce. It is understood that Chicago jobbers have adopted the following prices for Glass:

Single strength 90 and 15 per cent. discount; double strength 90 and 20 per cent. discount.

Machine Screws.—Some weakness has recently developed in the Machine Screw market affecting especially quotations on the rolled thread product, which now represent a large bulk of the business. Within a few days some manufacturers have announced lower prices to the larger buyers.

Linseed Oil.—Conditions in the Oil market remain much the same as during the preceding week. The demand for small lots for prompt delivery is fairly good, but in view of the strong position Seed has held crushers are unwilling to accept contract orders covering long deliveries. Consumers are equally unwilling to make contracts at present prices. Some large buyers still have contracts with crushers which have not expired. The high price of Seed has been attributed to the lateness of the crop and to foreign demand. Flaxseed now has a downward tendency, but this has not affected Oil quotations. At this point out of town Raw, in five barrel lots, is quoted at 48 cents per gallon, and City Raw at 49 cents per gallon. Boiled Oil is 1 cent advance over Raw.

Spirits Turpentine.—Owing to the reduction of spot stocks the local market has advanced 1 cent over last week's quotations. This is considered but a temporary advance. This market is now fairly steady at the following quotations, according to quantity: Oil Barrels, 55½ to 56 cents; Machine Made Barrels, 56 to 56½ cents.

Rope.—Prices have been sacrificed to some extent during the week by manufacturers in their desire to reduce stocks, and prices are consequently a little lower, particularly on Manila Rope. One manufacturer refers to the market as active enough to maintain prices if the price of Fiber had not declined, but as a rule business is not up to the average for the season. Two prominent Rope factories increased their capacity during the past summer. Manufacturers are reported as being well stocked with Rope, and with the abundant supply of lower priced Fiber there appears to be no immediate cause for higher priced Rope. Base prices are about as follows: Pure Manila, 11¼ to 12 cents; B quality grades down to 9 to 9½ cents; Pure Sisal, 9 cents; lower grades Sisal, 7½ to 8 cents; No. 1 Jute, ¼ in. and up, 8 to 8½ cents; No. 2 Jute, 7½ to 8 cents.

TRADE ITEMS.

THE STEWARD & ROMAINE MFG. COMPANY, Philadelphia, Pa., manufacturer of Expansion and Toggle Bolts, October 1 began the manufacture of all kinds of Bolts formerly made by the Boone Expansion Bolt Company, Port Richmond, S. L., N. Y. In the future the company will manufacture both the S. & R. and the Boone Single and Double Lock Nutted Expansion Bolts.

THE announcement is made by W. H. Daycock, Jr., that he has bought out the interest of H. E. Mechling in the partnership heretofore existing under the title of Mechling & Daycock. The business, it is said, will be carried on upon a broader and larger scale than heretofore, under the name of the W. H. Daycock, Jr., Company, at the same address, 81-83 Fulton street, New York. The house deals in iron, steel and metals for domestic trade, as well as for export and import, together with many other kinds of similar merchandise, from stocks of which immediate shipments can be made. It is the Eastern representative for the Edwards Mfg. Company and the "Trus-Con" Mfg. Company, and special agent for the Double Truss Cornice Brake Company and Royal Ventilator & Mfg. Company, with mills at Pittsburgh, Niles and Cincinnati.

THE stock of C. H. Bigler, president of the Springfield Hardware Company, Springfield, Ohio, has been purchased by H. C. Wiseman, treasurer and manager. This is one of the oldest mercantile houses in the city—having succeeded Janney & Wiseman, successors to H. C. Wiseman, as a corporation in 1890. The business will be continued as heretofore, Mr. Wiseman associating with him in the directorate and management two of the younger men of long and faithful connection with the interests of the

company—Thomas A. Welsh and T. J. O'Laughlin. Mr. Wiseman has been a prominent and influential citizen of Springfield for many years, and is now chairman of an important committee of the Commercial Club. He has also been conspicuous in the affairs of the Ohio Hardware Association, of which he is a past president.

W. M. BRIGGS has been appointed manager in New York of the Rock Island Tool Company, Rock Island, Ill., with an office just opened at 136 Liberty street, in the Electrical Exchange Building. Mr. Briggs was long associated with his father, who is manager of the L. S. Starrett Company branch house in New York. The Rock Island Tool Company manufactures Vises for every trade, including an automatic swivel Vise, which locks by tightening work in the jaws, an automatic swivel Vise with self-adjusting jaws for irregular work, stationary Vises and similar Vises with adjustable swivel jaws, a universal automatic swivel Vise which also permits of a horizontal or vertical position, and a swivel pipe Vise, all of which with others are shown in a catalogue recently issued. The company owns the patents under which the Jacobson Vise was made by the Jacobson Machine Mfg. Company, Warren, Pa., and has improved and increased the line.

F. R. Post has disposed of his interest in the Independent Tack Company, Cuyahoga Falls, to William Merrick of Cleveland, and has retired from the secretaryship of the company, that office being taken by Mr. Keeney, one of the stockholders. The enlargement of the plant is being considered.

THE ATLANTIC CITY CONVENTIONS.

ALL the indications point to an unusually large and representative gathering of manufacturers and jobbers next week at Atlantic City, where the annual conventions of the National Hardware Association and American Hardware Manufacturers' Association will be held simultaneously, beginning on Tuesday, 22d inst., and continuing until Friday, 25th. Reference has already been made to the programmes determined upon by the two associations, which promise much in the way of interesting and practical deliberations. Ample provision has been made for the entertainment of those who attend the conventions, including a sumptuous banquet on Friday evening, at which the principal addresses will be made by Hon. Charles Littlefield, member of Congress from Maine, who is well known especially to manufacturers on account of his position on the labor question, and by William Glasgow, Jr., counsel for the Interstate Commerce Commission. During the dinner there will also be a very fine musical entertainment rendered by grand opera singers.

PRESIDENCY OF SARGENT & CO.

GEORGE H. SARGENT has been elected president of Sargent & Co., New Haven and New York, thus filling the vacancy occasioned a few months ago by the death of his brother, J. B. Sargent. A merited distinction is thus given to the new president of this great corporation with which he has been so long and prominently identified, and to the upbuilding of which to its commanding position among Hardware industries he has so conspicuously contributed. The election of John Sargent to fill the place among the directors of the company thus made vacant is a fitting recognition of the younger generation in the carrying on of the work of the corporation.

THE PHILADELPHIA LAWN MOWER COMPANY, Philadelphia, Pa., has opened an office with H. E. Sturtevant, metropolitan agent, 18 Warren street, New York City. A full line of samples will be shown, consisting of 17 styles of Hand Mowers and several Horse Mowers; also Lawn Sweepers, Grass Collectors and Lawn Sprinklers. The line of Lawn Mowers will be very complete, including from 6¼ to 12 in. wheels and from three to eight blades. This arrangement has been made to serve the convenience of New York City trade and will doubtless be appreciated by the company's patrons.

Radical Programme of the Postal Progress League.

FROM OUR SPECIAL CORRESPONDENT.

WASHINGTON, D. C., October 15, 1907.

AS the date for the convening of Congress approaches activity on the part of the promoters of the so-called "postal reform" programme increases, and the policy of the Postal Progress League begins to crystallize along lines that will arouse renewed interest and attract attention in all quarters. The league is going into the coming Congressional campaign on a more radical, not to say populist, basis than ever before, and its chief representatives have come into the open with a frank avowal of their desire to bring about what is equivalent to Government ownership of railroads, with the entire business of transportation of persons and property in the hands of federal office holders.

Action of the Richmond Chamber of Commerce.

The extraordinary propaganda of the Postal Progress League, in which it would appear that the domestic parcels post may soon be one of the least radical features, is now being urged in the South, in the same sections to which the mail order houses have recently devoted much attention, not only in advertising their wares, but in seeking connections with manufacturers with a view to making shipments from factory to consumer on the basis of the shortest possible freight haul. During the past week Secretary James L. Cowles of the Postal Progress League addressed the Postal Committee of the Richmond, Va., Chamber of Commerce and secured the passage of a series of resolutions favoring a number of postal innovations, which constitute a curious combination of desirable and undesirable features. In view of the fact that Mr. Cowles is invading other Southern communities with a view to securing support for a programme which he thinks will appeal especially to that section of the country, the substance of the resolutions adopted by the Richmond Chamber of Commerce will be read with interest, as follows:

1. A general 2-cent 4-oz. letter post, 1 cent per each additional 2 oz.
2. A local 1-cent 4-oz. letter post, within city delivery limits.
3. A local rural post, limited to the different rural routes, all mail matter in one class, weight limit 11 lb.; parcels up to 1 lb., 1 cent; parcels 1 to 5 lb., 2 cents; parcels 5 to 11 lb., 5 cents.
4. A 5-cent registration fee.
5. A 2-cent foreign letter rate.
6. A fractional postal currency and postal insurance.
7. The substitution of "space" for "weight" in determining railroad mail pay.
8. An appropriation of \$60,000 for an experimental door-to-door rural service, using auto-post-wagons and doing all the general transport business within the rural routes.
9. An appropriation of \$— for a similar experimental city collection and delivery service.

It will be observed that the Postal Progress League puts into the foreground two propositions to reduce the rate of postage on first-class letter mail, which are undoubtedly the most rational and popular features of the entire programme. The resolutions also embrace reduced registration fees and foreign letter postage, to which there can be no opposition except on the score of possible loss of revenue. Skillfully interspersed with these more or less popular projects, however, are the rural parcels post and post check currency schemes, which are the objects especially desired by the Postal Progress League and its allies, the catalogue houses. With considerable shrewdness Mr. Cowles has refrained from asking these Southern business organizations to come out for full-fledged domestic parcels post, but by specious argument he has committed several of these organizations to a programme that would do the South greater injury than would be wrought by any other legislation that has been urged upon Congress in recent years.

Government Control of Transportation Facilities.

But while the parcels post promoters evidently find themselves at a disadvantage in working up sentiment for their pet projects in the South, in other sections of the country they throw off the mask and come out openly for complete Government control of transportation facilities. In a printed memorandum prepared by authority

of the Postal Progress League and furnished to the correspondent of *The Iron Age* by Secretary Cowles, an astonishing "Transport Programme" is set forth, which every retail merchant in the country should read with care and forward to his Senators and Congressmen with such comments as seem to him to be appropriate. Never before has the Postal Progress League shown its hand as in this "declaration of principles" which, in the interest of the independent, hard working and liberty loving merchants of the country cannot be given too wide circulation. The League's "programme" is in part as follows:

1.—GOVERNMENT CONTROL AND GUARANTEE OF FAIR RETURN ON INVESTMENTS.

The National Government, under its constitutional power over postroads, to take control of the entire business of public transportation, and to guarantee to the holders of transport securities a return on their investments equal to the average annual return of the past 10 years, a similar return on their cost to be guaranteed on roads recently built. (This will insure absolute safety to the investments of savings banks and similar associations. It will insure more than a square deal to railroad speculators.)

2.—MAINTENANCE, EXTENSION AND OPERATION OF POST ROADS.

The maintenance, extension and operation of the consolidated system to be under the control and management of an extended postal department, including the engineering corps of the army and navy; all postal employees to be enlisted as men are now enlisted in the army and navy.

3.—FUNDS.

As to funds, United States 2 per cent. 30-year bonds are worth 105. The nation will find no difficulty in raising money to build and maintain its own roads. It is a most wasteful policy to pay the Harrimans and the Hills 8 or 10 per cent. or more for money to build the highways of the people, when the people themselves are glad to furnish the National Government with funds at less than 2 per cent. Every additional mile of postroad, moreover, will raise the public credit, for to its own value will be added the increased value of the district which it serves.

4.—TOLLS, FREIGHT RATES.

Make the very lowest less than carload rate on merchandise the uniform rate for the station to station service, adding thereto the lowest possible rate for collection and delivery, to the end that we may have a universal door-to-door rate within the entire public service. A door-to-door rate of one cent a pound or less on small merchandise parcels, 25 cents on 100-lb. parcels, may be found quite practicable, once our public transport service is brought under the Post Office. On products usually transported in ton lots, coal, brick, ore, etc., a rate of 40 or 50 cents per ton station to station, with corresponding rates for collection and delivery, may suffice to meet the situation.

5.—HOURS AND WAGES OF LABOR.

Not over eight hours per day—not over 48 hours per week—the hours and the wages of labor to be determined by the representatives of the people in Congress.

6.—THE POST OFFICE DEPARTMENT.

The Post Office Department to manage the entire transport service and to be composed of one member of the national Cabinet and ten associates, each of whom shall be at the head of a postal division corresponding to one of the ten groups into which the railroad system of the country has been divided by the Interstate Commerce Commission, and shall be responsible for the transport business within his territory. The pending substitution of electricity for steam, resulting as it surely will in a reduction of perhaps 50 per cent., possibly more, in the running of our transport machinery, makes the present hour a most appropriate time for the consideration of this programme. The United States Government (UNCLE SAM), the representative of all of us, may be safely intrusted with the interests of each of us.

The average retail merchant will doubtless regard these as amazing propositions, but, after all, they are but the logical sequence of a domestic parcels post and the other paternalistic projects heretofore advocated by the Postal Progress League. From the taking over of the freight business of the country to the management of the railroads is but a short step, and if Congress will authorize the one it is not as unreasonable as at first glance it may seem to expect it to countenance the other. In any event it is well for the people of the country to know what the promoters of a domestic parcels post would have if they could get it.

The Outlook for Hardware as Seen by Retail Merchants.

With a view to obtaining advices in regard to the condition of business and the prospects for the fall and winter months, we have lately addressed inquires to representative Hardware merchants in the Central and Northwestern States. The substance of their replies is given in the following columns. It is gratifying to note the generally satisfactory conditions which they reflect and the confident feeling with which most of our correspondents regard the outlook for business during the next few months:

REPORTS FROM HARDWARE MERCHANTS IN ILLINOIS

No Falling Off in Building and General Outlook Good.

REPORT No. 1: There is no falling off in the building trade. Collections are up to the average and as soon as wheat sowing is over settlements will be made promptly. Hardware and Paint trade has been very good and promises to continue so. We look forward to good fall and winter trade. Have average crops, excepting fruit, and prices are above the average.

Conditions Very Encouraging.

REPORT No. 2: Everything looks favorable on the business horizon in this locality. Collections are good, there is considerable building and a large volume of business is being done in all classes of merchandise. Crops are much below the average, but are bringing high prices, and will bring as much money into the State as larger crops with lower prices.

Cost of Living Is Hitting Some Classes Hard; Farmers Best Off

REPORT No. 3: Locally, building has been very quiet this year. We look for more next year. Collections are good. Factories are running well. Fall and winter trade is expected to be fully up to the average, although the cost of living is hitting some classes hard. Farmers seem to be best off of any class.

Excellent Prospects and Looking Ahead with Confidence.

REPORT No. 4: There has been a decided falling off in the erection of new buildings, which is to be attributed to the high prices of building material. To offset this, there is a large amount of remodeling and repairing. This class of work has naturally been delayed because of the unwillingness of mechanics to do same as long as there was new work in sight. Collections are fairly good.

The prospects for fall and winter trade are excellent, as every one in this community is well employed. The earnings of our mechanics were never greater. Farmers in this vicinity, who formerly paid from \$18 to \$25 per month for their help, are now paying \$2.50 per day and board. Farm products in general and milk in particular are bringing an excellent price. We are confidently looking ahead to a large volume of business.

Conditions Such That Good Trade Must Follow.

REPORT No. 5: There are no indications of any letting up in the building line for this fall. Collections are fully as good as usual and we think the prospects for the fall trade never were better. Good crops, good prices, good wages and full time must make a good trade.

Collections Have Never Been Better, and Fall Trade Ahead of Last Year.

REPORT No. 6: The farmers throughout our country are in the most prosperous condition possible. Corn is going from 50 to 60 bushels to the acre and is worth 60 cents per bushel, which makes the farmer the largest income he has ever received for his land. Collections have never been better than at the present time. Fall trade is very much ahead of last fall, not only with ourselves but in general in this locality. I cannot see anything which can stop the prosperity of this section of the country, as it all depends upon the farmer, and the farmer is certainly getting good crops and good prices.

Price Advances Have Borne Hard on the Merchant.

REPORT No. 7: Business conditions in this vicinity on the whole are satisfactory. There has not been as much building here as in previous years, and we believe that the high price of materials has unquestionably checked it

to some extent. Collections are good, and considering that we are now assured that our corn crop will be gathered in good condition we see no reason to doubt that trade will be satisfactory during the fall and winter. Owing to the light oat crop in this vicinity we think possibly our early fall trade has been curtailed to a slight extent, but not seriously, as prices have been uniformly good. We do not regard, however, the present conditions as particularly favorable to the Hardware dealer, inasmuch as we have been unable to advance our prices to correspond in all instances with advances made by the manufacturer and jobber.

A Let-Up in Building, but Prospects All Right Otherwise.

REPORT No. 8: There is a decided letting up in building through this section, some of the larger towns having been affected to a greater extent than our town. This is due, however, to the fact that they had more of a boom in building, while ours was simply a steady growth. High prices on building material, especially lumber, is the cause for this, as there is plenty of money in the country and conditions are entirely favorable. The people at large, however, seem to have become dissatisfied with the numerous combines and association, who have advanced prices on Lumber, Builders' Hardware, &c., to a point where they feel it is an imposition, and it is a very common occurrence to hear a man say he is going to build after prices become normal. In other words, he can afford to live in his present home until conditions are more satisfactory. Collections are good.

Prospects for fall and winter trade are good outside the building line. Our furnace business has been larger this year than ever before, and most of the work has been done in old residences, which is another indication that there is ample money in the country, and people are willing to spend it, but are not willing to pay the advance price on lumber, &c.

REPORTS FROM HARDWARE MERCHANTS IN IOWA

Consumers Strong Financially and Buying Better Grade of Goods.

REPORT No. 1: Building in this section will not let up until the winter opens up and forces a stoppage of outside work. There is a great demand for all kinds of mechanics and laborers and building has been delayed here by a scarcity of skilled laborers to perform it. Collections are slow, and likely will be until the crop commences to move, as this is almost entirely an agricultural country. The prospects for fall and winter trade are good. Consumers generally are in good financial condition, and we notice a demand for a better grade of goods all the time. There appears to be plenty of money in the country, as all banks report a large deposit.

No Trouble in Getting Full Value for Merchandise.

REPORT No. 2: In this territory everything is booming, and while we do not think there are quite as many buildings going up as in 1905 and 1906, those that are under construction seem to be of a better grade. Collections are up to standard. Prospects for fall and winter trade are exceptionally bright.

People have been talking about high prices so much the last few months that we do not have any trouble getting the full value for our merchandise. We have not hesitated to buy our regular season's supply of fall and winter goods, except where the goods have made unreasonable advances.

Merchants Are Feeling a Bit Blue.

REPORT No. 3: Building in this vicinity amounts practically to nothing as a result of high prices of materials. Collections are good. Crops are generally fair to good. Indications for fall business, judging from the present

demand for goods, are not very flattering, as merchants in all retail lines are complaining about poor trade the late summer and early fall. What the colder weather will bring forth is still to be seen, but dealers are feeling a bit blue.

People Are Buying Freely and Are Paying Their Bills.

REPORT No. 4: Indications are that there will be no let up on building this fall; we have more building going on at present than we had last year at the same time. Collections are good. People seem to buy freely and are paying their bills. Prospects are good for fall and winter trade. We are lined up for a larger trade than we had a year ago. Our business this year has exceeded last year's every month, with exception of March and June.

Crop Shortage Makes Prospect for Fall and Winter Only Fair.

REPORT No. 5: General building operations have been quiet in this vicinity for the past five years. The tendency is for an increase rather than a letting up. Collections are good. Owing to a decided shortage in farm crops in this section this fall, prospects for fall and winter trade are only fair.

This Year the Best in Four, and Prospects Fine.

REPORT No. 6: We do not expect building to let up, rather think there will be more building next year. Collections have only been fair. Prospects for fall and winter trade are bright, and so far this year has been the best of the past four years. If it continues at the same gait it will be our banner year.

Conditions Healthy and Future Prospects Satisfactory.

REPORT No. 7: We have enjoyed a very good business during the year. The crops in this territory are not very good, but the high prices that farmers are receiving about offsets the shortage. There is not a large amount of building, although a very healthy condition exists among our customers. Collections are very good, and prospects for business are fair.

Very Little Building, but Good Business Expected.

REPORT No. 8: There has been very little building the past summer, and the indications for the fall are that there will be no increase or change. Collections during the early fall have been good, and owing to a good harvest the prospects are very favorable for a continuance of plenty of money and easy collections. All conditions point toward an improved, profitable and steady business for the fall and winter trade.

Almost a Building Boom.

REPORT No. 9: Our town and country never came so near having a building boom as during the present year and prospects are favorable for the coming season. It will hurry everybody to get contracts out of the way before winter. Collections are fully up to the average.

REPORTS FROM HARDWARE MERCHANTS IN INDIANA

Best Prospects in Many Years.

REPORT No. 1.—The indications for building in this community are as good as we have ever had. Collections are fair and the prospects for fall and winter trade are the best we have had in many years, mostly due to the excellent crops and the high prices the farmers are getting for their commodities.

Farmers Will Have as Much or More Money Than a Year Ago.

REPORT No. 2.—Building this year to date is higher in percentage than last year, and prospects are good for the balance of the year, if weather is all right. Collections are fair. Prospects for fall and winter trade are good. Farmers will not have as large a crop as last year, but with present prices higher than a year ago, will have probably as much if not more money than 1906.

Fall and Winter Trade Will Be About the Same as Last Year.

REPORT No. 3.—There has been very little building here this year, and we do not see any prospect of any better conditions for next season. Collections are as good as they were last year; in fact we have nothing to complain of in this direction. Farmers seem to have plenty of money. In regard to fall and winter trade we do not think it will be very different from last season. We think our trade would have been better if it were not for the rains we had in early April. These rains

came just at a time when the corn should have been put in.

Cash Sales and Collections the Best in Seven Years.

REPORT No. 4.—Business in all departments during the year 1907 has been entirely satisfactory to us, volume of sales has been greater than any time in the history of our business, and to all appearances there is no indication of a change.

We anticipate fully as great a business, at least during the first half of the coming year. Our collections have been about 20 per cent. in excess of last year, in fact, our cash sales and collections are greater in proportion to our volume of business than at any time during the past seven years.

Poor Business During Summer, but Improvement Now Noted.

REPORT No. 5.—Business has been very poor all summer, but looks better now and prospects for the fall and winter are fair. Collections are moderate.

Expects a Very Large Fall Trade.

REPORT No. 6: Crops in this locality are generally good and prices very high for everything which the farmer has to sell. Building is apparently as active as ever, although many talk of not building at present on account of high prices of materials and labor. Help is scarce and wages good. I cannot see any reason why we should not have the largest trade this fall which we have ever had. Of course, in our line we must depend on seasonable weather. We have not had good seasonable weather here in either spring or fall for three years. Late cold springs and late warm falls. This always makes the sale of seasonable goods unsatisfactory. Our collections are good, and every one apparently has money.

Prospects Bright and All Retail Stores Report Gains Over Last Year.

REPORT No. 7: Business in our city is exceedingly good. Our factories are very busy at present with orders booked several months ahead. Labor is very scarce and high. Some of our factories are drawing heavily on neighboring cities for both laborers and mechanics. Building is very good and houses are in great demand. Collections are good, although they should be better on account of the labor conditions.

Prospects for fall and winter business are bright. All of our retail stores report gains over corresponding months last year. Farmers have enjoyed the most prosperous year this section of the State has ever known. They are all jubilant over their year's showing. Have more goods to market and grain to carry them through next year. They have good bank accounts and plenty of stock. Our banks are in good financial condition. Have increased their undivided profits and surplus after paying good dividends.

With all of the above conditions we can reasonably expect prosperous times for some time to come. However, it might be well to remember that these times will not last always. Do not allow expenses to run too high; be conservative and lay up a few dollars for the rainy days and shrinkage in prices that are sure to come.

Business Volume Thus Far in 1907 Equal to Last Year.

REPORT No. 8: The volume of our business for 1907 thus far is equal to that of 1906. We had anticipated a larger volume by 10 per cent. over 1906, but continual advances, especially in the lines that we sell to farmers and builders, affected the demand quite a good deal, but in the lines in which there was but little advance we had a marked increase of sales, so that one offset the other. The advance in building material in this immediate locality has put a damper on building to a great extent. It especially affects those who build for investment.

Collections are not satisfactory. Farmers are asking for extension of time until corn and hogs are marketed. The farmer does not pay the village blacksmith. The village blacksmith does not pay the merchant; the merchant cannot pay the jobber, and the jobber must borrow to pay the manufacturer. This condition, however, is cleared up because of the bright prospects for heavy corn crop and good prices for all farm products. Farmers are beginning to contract for implements and material for farm improvements for the coming winter and spring.

We have hitherto enjoyed an enviable Fence business with the farmers, and find that this line is suffering most on account of advanced price. We have a larger volume of business on farm implements booked for future delivery than any other year at this date.

There is a tendency on the part of many of our manufacturing concerns toward conservatism in buying of

Tools and material, although they make claim that their prospects are just as good as last year. There seems to be an impression that high prices have reached their limit and that the new year will bring a declining market. This is the common reason given by the average buyer.

A Time When Every Merchant Should Be Extra Watchful and Conservative.

REPORT No. 9: We have to say of the conditions and the outlook in our immediate territory that there has been evident all this year a marked decline in building operations. This applies more to new structures than to necessary improvements, and we attribute it to the high price of building material and labor. Necessary repairs and betterments are still as much in evidence as in the past years, and labor is fully employed at unusually high prices everywhere, and it is very hard to secure help enough to finish up the season's work.

Collections are better than a year ago and should continue to be easy, as our farmers are receiving unprecedented prices for nearly all products, and their net profits on the year will be as large and probably in excess of former prosperous years, even though their wheat and oats crop were short on yield.

We confidently expect the largest fall trade in our experience. Range and Heating Stove trade is unusually good, and in other lines we anticipate a larger trade than usual.

Beyond the closing of the year we are not so confident. The complaint of increasing costs is assuming serious import. It is a popular impression that the advances are not justified; that the monopolies are extracting more than a just advance, or, in other words, are using advancing labor and raw material costs as a cover to an unjust increase in profits.

As long as the farmer is getting big crops and pig prices he will not protest so much, but the great middle class who work on fixed salaries is being hard pressed to make ends meet, and is apt to give a surprising expression to their dissatisfaction at the first opportunity at the polls.

Conditions are at that stage and at that tension that when short crops come to the farmer, look out for a reaction and a crash that will make the times of '93 "look good" in comparison.

In our opinion this is a time when every merchant should be extra watchful and conservative, keep stocks at lowest stage possible to meet the demand of his trade, collect closely, and guard his credit list, confining it as nearly as possible to responsible people.

REPORTS FROM HARDWARE MERCHANTS IN MINNESOTA

Good Prospects as a Result of Fair Crop and High Prices.

REPORT No. 1: The prospects for fall and winter trade are good on account of a fair crop and high prices. Collections are satisfactory.

Do Not Look for Brisk Trade This Fall and Winter.

REPORT No. 2: Building has been practically at a standstill in our locality on account of crop failure last year, but fall trade is a little better. Collections have not been coming in very well as yet, principally, we believe, on account of the backwardness of the season. The farmer has had too much to do at home. We do not look for any brisk trade this fall and winter, but may be mistaken.

A Letting Up in Building and Collections Slow.

REPORT No. 3: The indications point to a letting up in building. Collections are rather slow. The prospects for business during the fall and winter are by no means good.

Business and Collections Will Probably Be Good.

REPORT No. 4: Building has been quiet here this year, owing in a measure to the light crops in the past and to the increased cost of building material. It is a little early for collections here, but we have a reasonably good crop and good prices, and we are looking forward to good collections and a good fall and winter business.

Copper Depreciation Has Had a Baneful Influence.

REPORT No. 5: Building is slackening up some, and we question if it will be as good this year as it was last year

or the year before. We also question as to whether we will have as good a fall and winter trade as we had last year. The principal reason for doubting this is that this city has had quite a rap in the copper market. A large portion of our best citizens were loaded up with copper stocks that have flunked a good deal in the last three months.

Extreme Prices of Lumber and Other Materials Will Hurt Future Business

REPORT No. 6: Business conditions in this section are very good. Crops as a whole are fair, which, with the high price of all kinds of produce, gives the farmer a very good return for his year's labor.

Building operations have been quite active, but are showing signs of letting up on account of the extreme prices of lumber and kindred materials, and we are not looking for as good a year in 1908 as the present one has been.

Collections, we expect, will be good a little later, when the farmer has caught up with his work and commences to market his produce.

Farmers Have Money, but Won't Loosen Up and Settle Store Bills

REPORT No. 7: Prospects for fall and winter trade in this section are about the same as last fall and winter. Our building season is about over with here for this year. Everybody is busy getting buildings of all kinds ready for the winter, so as to house man and beast. Collections are very slow, though we can see no reason why this should be so. Everybody that labors gets good wages and the farmer is receiving better prices for what he has to sell than for years. The crop yield was not so large as in former years, but high prices more than make up the difference. One dollar per barrel for barley here in our section has never been heard of before by the oldest settlers. But they will not loosen up on the pocketbook to settle up store bills. I do not look for anything out of the ordinary run of business this coming fall and winter.

The Day of the Agriculturist Is at Hand.

REPORT No. 8: Ours is an agricultural and dairying country, with some few factories in town. Building is equal to, or ahead of, last year. Collections are good. Prospects for fall and winter trade are good.

We believe the day of the agriculturist is at hand. The flocking to cities and their extraordinary growth has resulted in a corresponding demand for farm products that has brought the market to the farmer's door. He does not have to compete with his brother farmer and take orders from the country store, by means of which he is obliged to trade out all the proceeds of his butter and egg sale. The demand has so far increased that he sells for cash at a greatly enhanced price, and the question arises: Will the output of the stock and dairy farm ever again be in excess of the urgent demand from town and city?

The only problem now for the farmer to solve is the labor problem. He cannot get help enough, although offering greatly increased wages. The help problem is a serious one everywhere in the Middle West.

Usual Fall and Winter Trade Expected, but Will Buy Conservatively.

REPORT No. 9: Owing to the present high price of building material, especially lumber, together with the scarcity of labor and the price thereof, there is a decided letting up of building. Our carpenters and builders are all busy, however, and the demand for houses exceed the supply.

Collections are a little slow this fall, owing to the unusual amount of rain, which has delayed threshing and farming operations generally. Crops were very light and of poor quality, but prices range very high, hence the farmer will realize about as much money for what he has to sell as usual.

Summing up the conditions, favorable and unfavorable, we expect, and are preparing for, our usual fall and winter trade. Nevertheless, we are trying to avoid overstocking, as we believe prices are too high, and a reaction is liable to follow.

The increased cost of transportation is a menace to the trade just now. The railroads, either in order to play even, or to create a sentiment against the 2-cent passenger rate, are changing their classifications, advancing the minimum charges and swelling the weights. Shippers could help the retail merchant in the matter of weights if they would weigh the goods before shipping and send duplicate receipts with weights attached.

REPORTS FROM HARDWARE MERCHANTS IN WISCONSIN

Shortage in Farm Produce Made Up by Higher Price.

REPORT No. 1: Business in this section is only fair at present, but prospects for coming fall and winter months are good. Farm produce is something short in quantity and quality, but the high prices received more than make up for shortage.

Last Year's Trade Was Very Satisfactory, This Year's Will Be Better.

REPORT No. 2: Up to a month ago trade was better than last year, but the farmers are very busy now harvesting, but we believe that when the fall and winter trade starts in we will enjoy even a better trade than last year, which was very satisfactory.

Business Has Been Excellent and Will Be Even Better.

REPORT No. 3: Our business for the last six weeks has been better by 25 per cent. than for the corresponding period for the last three years. We have every reason to expect the same increase the balance of the fall. We are of the opinion that other lines will compare favorably.

Trade During 1908 Will Be Light.

REPORT No. 4: Our general trade is very good. Stove trade is late owing to warm weather. We look for a big Stove trade later. Job work all we can attend to. Crop average is about 50 per cent. less than last year. Higher prices prevailing will, however, help out farmers a little. Trade for 1908 surely will be light.

Business Fully Up to Last Year, and Fall Demand Will Be Good.

REPORT No. 5: Business with us is fully up to last year. The season was very backward, corn had to be replanted once or twice, and we had a great deal of rain during the summer, but as frost held off unusually long this fall most everything is turning out better than was expected in the summer; even corn is turning out fine. As products of every kind are bringing higher prices than last year, our farmers are in good condition to buy, as are also our city people, as every factory has been running this year. As we are doing a great deal of street work there is a good demand for all kinds of labor. We look for a good fall business.

Present Year 25 Per Cent. Better Than Any Former One.

REPORT No. 6: This is a dairy country and largely dependent upon good pasture. The pasture is the best we have had for years. The hay crop was abundant; corn crop is better than the average; oats very poor, but the acreage was small. Prices for farm products are very high. Trade is excellent, collections good, and I think the year will prove at least 25 per cent. better than any previous year.

A Slump in Business with the Coming of October.

REPORT No. 7: Trade was fairly good up to October 1. Since then it seems to have taken a sudden slump, for what reason is hard to judge; yet it appears from what we can learn every one seems to be suddenly holding off and buying is not going to be so energetic. Prudent men will cut their stocks down by the end of the year and await the future outlook, to some extent at least.

REPORTS FROM HARDWARE MERCHANTS IN OHIO

Business Up to Standard, with Good Prospects.

REPORT No. 1: Business in our section is fully up to last year's standard. The prospects for fall and winter trade are good.

Crops a Good Average, Prospects for Trade Excellent.

REPORT No. 2: Crops were a good average in this region. Business prospects were never better for this time of year than at present. The weather has been favorable so far.

Business and Prospect Very Favorable.

REPORT No. 3: Business is very flourishing in this section of the country this fall. Prospects are very bright for fall and winter trade.

Every body Busy, Prospects Good.

REPORT No. 4: Our shops are exceedingly busy and laborers short. Real estate men report business pretty brisk, grocerymen report business extra good, dry goods and clothing store trade report the last two weeks exceedingly quiet. Hardware is on about the same basis as a year ago, with the exception of the last few days, when business has been very quiet. Prospects for the fall and winter seem to be on a plane with this time last year, possibly not quite so encouraging.

Sales to Date Larger Than Last Year.

REPORT No. 5: We have been and are enjoying a trade equal to, if not better than, last year, our gross sales to date being slightly larger than last year. Prospects are very good for a nice fall trade. Some crops are, of course, short, but as a whole are showing up better than expected earlier in the season. The good prices will also help to put the farmer in good shape for the winter.

Prospects Bright, but Doubtful About Values Holding, and Is Buying from Hand to Mouth.

REPORT No. 6: Business is good. Prices are high, it is true, but people seem to have money to buy goods, and my trade is larger than it has been in the past two years. The prospects for the future look bright and I can see no reason why good business should not continue at least for six months. I am a little doubtful about values holding and am buying from hand to mouth in the hopes of reducing my stock by February 1.

Tight Money Market May Have an Influence.

REPORT No. 7: Trade is most excellent, owing to the fact that more new buildings are going up in our city this year than ever before in its history. Our factories and workshops are all busy and all who want employment can get it. In the past summer we had no dull season such as we usually have had in other years.

As for the fall and winter, we are not so sure as we should like to be, in as much as the building and loan associations and banks are unable to meet the demands for money which prospective builders are making on them. Were it not for this tightening in the money market we would have a phenomenally good fall and winter trade.

An Optimistic View.

REPORT No. 8: In this section of the country we have felt no slacking up in business, and, in fact, trade for September and October up to this time has been better in a general way with the Hardware trade, and in all other lines, than the months that have gone before.

It would seem that the farther west you go the better the indications of prosperity are, and this seems to hold good all the way to the coast. In Ohio, particularly, we feel that prosperity is not ready to leave us, and that we can look forward to almost an indefinite continuance of these good times. There is a slight weakness shown in some Hardware lines, but not such a weakness as to create anything like a panic or justify a feeling that prices may slump later on. The writer takes an optimistic view of the days that are to come.

REPORTS FROM HARDWARE MERCHANTS IN MICHIGAN

Momentum of Trade Is Irresistible.

REPORT No. 1: We can see no indication of a let-up in building this fall, and business generally remains as good, if not better, than last year. Collections are as good as they have ever been, and we shall go into the fall and winter under a full head of steam. We believe the momentum of trade is "irresistible," and we see no "immovable body" on the track.

Prospects Never Looked Better.

REPORT No. 2: We are pleased to say that the building business seems to be increasing instead of decreasing. Collections as far as we know are good, and the prospects for a good fall and winter trade never looked better if we may judge from our own.

No Reason Why Prosperity Should Not Continue.

REPORT No. 3: The outlook for business in this section is good. There is no let-up in building, although at present there are no large structures in process of construction. Collections are good, considering that this is a fruit country and that crops were materially injured

by the cold wave that struck us about a year ago. Prospects for fall and winter trade are quite favorable. Speaking in general, do not see why prosperity should not continue.

Merchants Have Every Reason to Feel Satisfied with the Present Outlook.

REPORT No. 4: So far as our business is concerned conditions are just about the same as they were this time last year. Collections have been perfectly satisfactory and the outlook for the next few months is bright. Naturally at this time of the year there is a letting up in the building trade, but this is no more pronounced, as far as I can see, than is usually the case. Everything considered, I feel as though the retail Hardwareman has every reason to feel satisfied with the present outlook.

Notwithstanding Curtailed Production of Lumber, Business to Date Ahead of Last Year.

REPORT No. 5.—There is an inclination on the part of lumbermen in this section to somewhat curtail their production this year, on account of its being so hard to secure labor, also on account of the high price of labor secured. They feel that the cost of operation is going to be considerably more than it should be, and judging from appearances it looks as though the output of Lumber for Upper Michigan would be cut this season 20 to 25 per cent. General business up to date, however, has been remarkably good, and we have experienced little trouble this year in collections.

The storekeepers in most instances this season have not over-stocked, and on this account are not owing any great amount of money. We do not look for any financial trouble this fall or winter, and notwithstanding the slight reduction in woods operation, we believe general business will be very close to last year's trade. From January 1st to date it has been considerably ahead of last year.

Plenty of Money and Prospects Excellent.

REPORT No. 6.—Local conditions here are fine and dandy. House building has not been as good as last year, but our farmers are building more and larger barns. There seems to be plenty of money, owing to extremely

high prices that farmers are realizing for all their products.

We sell for cash, and so are not called upon to collect. The big catalogue houses are in evidence, but many of our customers are finding that all is not gold that glitters. We never have had any trouble to meet that kind of competition when given a chance. Prospects for fall and winter trade are good. Scarcity of help in town and on the farm, with continued wet weather, have set us back a little.

This table shows difference in prices to day, as compared with this time last year.

	1906.	1907.
Peaches, per bushel.....	\$0.25 to \$0.50	\$2.00 to \$3.00
Apples, per bushel.....	.10 to .25	.60 to 1.00
Grapes, per basket.....	.05 to .10	.25 to .40
Potatoes, per bushel.....	.20 to .25	.55 to .60
Oats, per bushel.....	.33	.70
Corn, per bushel.....	.40	.78
Dairy Butter, per pound.....	.15 to .18	.25 to .28
Creamery Butter, per pound.....	.20 to .22	.30 to .33

Above are wholesale prices.

Trade and Collections Up to Average, but Much Depends on Attitude of Copper Producers

REPORT No. 7: We are governed by local conditions entirely. Our only industry being the mining of copper, anything affecting the copper market affects us. The recent slump in copper and the consequent drop in values of copper stock has had a strong tightening influence on money in this vicinity. This is also felt in the abandonment for the present of some building projects.

Taking it as a whole, trade and collections up to this time have been fully up to the average. However, if the mining companies adopt the policy of laying off any great number of men it certainly will have a depressing influence. Personally we do not look for business to settle until after such time as the politicians and manipulators get through mixing things up.

We also think that steps should be taken to make financial papers authenticate statements made in their columns. As it is now, the public have no means of knowing what is authentic and what is not. We have been told for the past six months that there was not copper enough to supply the regular demand; yet when the cellar door is lifted we find 8 to 10 months' consumption in the way

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of surplus. We say if papers cannot print facts, then be honest and leave their columns blank; do not aid unscrupulous manipulators by sending out statements that are misleading and wide of the truth.

Collections Up to Average and Prospects Good for Fall and Winter Trade.

REPORT No. 8: There has no doubt been some curtailment or giving up of plans for new buildings, but in general there seems to be considerable building going on, especially is this true in remodeling old buildings, despite the fact of the marked advance in building materials.

We estimate collections fully up to a year ago, although just at this time there is some deferring of payments, on account of the unusual fall rains, which have prevented the harvesting of the late crops, especially in beans, making it impossible for the farmers to realize until later from this crop. We believe, however, that collections will fully average up to this period of 1906.

While there has been some decrease in the average yield of wheat and corn in our State, our county is not as dependent on these two crops, as diversified farming is carried on to a greater extent than some years ago. The farmer has been able to realize from the dairy, cucumbers, sugar beets, beans and potatoes, which are important factors in our prosperity, and locally results have been quite satisfactory, in the face of adverse conditions as to weather.

We believe the prospects are good for a large volume of business during the late fall and winter months.

REPORTS FROM HARDWARE MERCHANTS IN NORTH DAKOTA

Fall and Winter Outlook Not Encouraging.

REPORT No. 1: On account of short crop the prospects for fall and winter business are not very good. Trade up to date has been fair.

Trade and Collections Should Come Pretty Near Average.

REPORT No. 2: Conditions seem to point toward a fair trade this fall. Crops are short, but with prices as high as we have them I think trade and collections should reach pretty nearly the average.

Trade, Collections, Prospects, All Very Favorable.

REPORT No. 3: Trade in all lines of Hardware is particularly good. Collections are very satisfying to date. Future prospects are the best for several years.

A Fair Trade Looked For During the Fall and Winter.

REPORT No. 4: We depend largely on small grains in this community. Basing business on past years' experience, we anticipate a fair trade this fall and winter. The yield is a little below the average, but good prices will balance matters up to an average crop.

Farmers Will Be Left in Better Shape Than for Years Past.

REPORT No. 5: Business this year has been very satisfactory, and there is more building in sight than there are men to do the work. Crop conditions locally are fair and we have no cause to complain, but we believe the high prices for cattle, sheep and all farm products will leave our farmers in better shape financially than they have been for many years past. Next year will also see a great many new settlers come here from the East. There is yet plenty of room and plenty of cheap land.

North Dakota Wheat Crop Returns Very Irregular.

REPORT No. 6: Business in our section of the State has been fairly good during the summer months. We believe that business here has been somewhat better than in the inland towns, as we have more or less city work that keeps us busy when crop conditions are not the best throughout the State. The 1907 wheat crop in North Dakota is very irregular. In some sections the yield is very small, in others fairly good, but it is generally thought that the returns to the farmers for this year's crop will exceed those of last year, as the prices for all kinds of grain are so much in advance of last year.

We look for a fairly good trade this fall, but as far as the winter trade goes we do not have anything of that kind in North Dakota. From January 1 to March 15 most everything in our State is at a standstill.

REPORTS FROM HARDWARE MERCHANTS IN NEBRASKA

Business Never Better and Outlook Excellent.

REPORT No. 1: Business in this section was never better, and I see no reason why we should not expect it to continue good for some time. Crops are good and prices for farm products are higher than for many years. Help is a serious question, it being simply impossible to secure competent men at any price.

The Most Conservative Believe Prosperity Will Continue.

REPORT No. 2: Business in every line is very heavy. Prices are ruling higher. Corn and hay crops are better than expected, winter wheat never better, and oats fair. Farmers are accumulating wealth and becoming better spenders.

Building operations are going along regardless of higher prices. Labor is scarce in consequence of the demand, yet no labor troubles are anticipated. The most conservative believe in continued prosperity and feel secure in pushing improvements.

A Bright and Promising Outlook.

REPORT No. 3: With reference to business conditions in this section of the country, desire to state that while a little hot weather damaged the crops to a certain extent, the prevailing high prices which farmers receive for same will more than offset the damage done by the drought, and therefore I regard the outlook as bright and promising. Building operations are progressing in the usual brisk manner. So, all in all, conditions are prosperous and trade is good.

Conditions Quite Favorable.

REPORT No. 4: Business is excellent, with us and prospects for the fall and winter are very favorable.

Last Year a Banner Year and This Year Just as Good.

REPORT No. 5: Our trade is somewhat behind last year's, but not enough to say that trade is not as good as last year. Last year, of course, was a banner year with us, and we expect to do fully as well this year by the time it is out. Prospects for the balance of the year are excellent.

No Reaction Looked For.

REPORT No. 6: Business in our line is exceedingly good. It has been a big year and we have no reason to think but what the fall and winter trade will be proportionately good. There is a great deal of building going on here at the present time, which bids fair to continue as long as the weather is favorable.

Collections are very good, and we, while taking a conservative view, have no reason to look for a back set in business conditions.

People Have the Money to Buy and Are Buying Freely.

REPORT No. 7: Business has been very good with us and prospects for a good fall and winter trade are very flattering. While crops were not as good on the average as last year, the increased prices of all farm products more than makes up the difference. People have the money to buy with and are buying freely, and we look for this condition to maintain throughout the winter.

Doing Business at This Time Certainly a Conundrum.

REPORT No. 8: Business is good, and prospects for fall and winter trade could not be better. We are, however, facing a hard proposition with expenses of doing business constantly increasing and profits decreasing so much so that I find it necessary to use a powerful microscope to find the dividends. Doing business at this time is certainly a conundrum. Certain periodicals advocate "Meet catalogue house prices." Manufacturers and jobbers shout themselves hoarse with "advance prices" and talk quality. Which way shall we jump? I feel somewhat like the Scotchman when he said, "When a man is up, he's up; when a man is down, he's down; when he's half way up and half way down, he's neither up nor down." The question in my mind is, where are we at?

REPORTS FROM HARDWARE MERCHANTS IN MISSOURI

Building Very Active and Farmers Exceedingly Prosperous.

REPORT No. 1: So far as building is concerned, we have had the best year in 10 years, and work keeps up well. Collections are fair. Our country has been exceedingly blessed with crops, which are selling at very high prices. Farmers are exceedingly prosperous, are dehealthy live stock. A good price is paid for everything produced, and are buying good goods. Prospects here are remarkably good.

Lots of Building and Farmers Buying Mostly for Cash.

REPORT No. 2: House building has been very good, principally in small cheap residences, single and double, for laborers and mechanics. Very few costly buildings have been erected here. Population is increasing. Collections are good. Farmers mostly buy for cash.

The future looks bright. We have an immense crop of corn; other grains, wheat and oats, about 75 per cent.; healthy live stock. A good price is said for everything. Any reasonable person should be satisfied.

REPORTS FROM HARDWARE MERCHANTS IN SOUTH DAKOTA

Stoves of Good Grade in Large Demand.

REPORT No. 1: Trade is good and prospects for the future are satisfactory. Never saw as many people looking for Stoves, and a good grade of Stoves, as at the present time.

Prospects Never Better and Farmers Rejoice.

REPORT No. 2: Business is good, and prospects for fall and winter trade were never better. Much substantial building is in progress, that will run on into another year. Farm crops were only medium, but the very high prices causes the farmer to rejoice. Collections are good.

REPORTS FROM HARDWARE MERCHANTS IN KANSAS

Crops Short but Plenty of Money in Evidence.

REPORT No. 1: Hardware trade this fall has been very satisfactory. While some of the crops are short in this section, there seems to be plenty of money to do business with and collections are fair. Prospects for fall and winter trade are good. There is quite a demand for Fencing, as well as for Builders' Hardware. Stove trade is starting off well.

No Let-Up in Building and Outlook Fair.

REPORT No. 2: There are no indications of a let-up in building. Collections are good, and business during the remainder of the fall and the winter ought to be fair.

NORVELL-SHAPLEIGH HARDWARE COMPANY'S GREETING TO THE PRESIDENT.

AMONG the profuse decorations which graced the business houses along the course of President Roosevelt's drive on the occasion of his visit to St. Louis, October 2, none excelled in uniqueness or attracted more attention than the display made by the Norvell-Shapleigh Hardware Company. On a platform erected on the corner of the building were stationed 12 "Teddy Bears" armed with air rifles pointing down the street. Below the platform was a conspicuous sign bearing the inscription, "We are laying for Teddy." The branches of a tree rising 25 ft. above the platform were also filled with Teddy Bears, similarly armed and high up four more were perched in a large diamond illuminated with electric lights. Still others dangled from a rope suspended from a pole extending out from the roof of the building. A background of colored bunting heightened the effectiveness of the novel display. It is needless to say that the cleverly suggested humor of the design caught the crowd and made a great hit.

NET VALUES OF RETAIL ASSOCIATION MEMBERSHIP.

BY HOOP IRON.

HOW many retail Hardwaremen do you know intimately?" I asked an ex-Hardware merchant. "Scarcely one," was his answer.

This man spent 27 years behind the counter as clerk, partner and sole proprietor of a flourishing Hardware business. He sold his business to become a banker in 1889, before our association was organized. A few days before the annual convention he expressed a desire to attend, but after thinking it over and remembering that he would be a comparative stranger there decided not to go.

What would 27 years in business mean now to an association member? It would mean one friend or more in practically every city and village in the State.

To think that it would be almost impossible to strike a community in the State but that you would have a cordial handshake coming and a friendly desire to serve you by a friend, carries a net value greater than selling D. P. Tacks at 5 cents a paper.

No class of men can listen to and appreciate Hardware talk and stories like Hardwaremen, and there is a wealth of mutual good fellowship and pleasure when they get together.

Joining the association is a short cut to large profits in the field of pleasure and happiness.

REQUESTS FOR CATALOGUES, Etc.

The trade is given an opportunity in this column to request from manufacturers price-lists, catalogues, quotations, &c., relating to general lines of goods.

REQUESTS for catalogues, price-lists, quotations, &c., have been received from the following houses, with whom manufacturers may desire to communicate:

FROM THE MINERS' SUPPLY & MFG. COMPANY, Leechburg, Pa., which has just been organized and incorporated with the following officers: Anthony Maridon, president; R. P. Hunter, treasurer; W. S. King, secretary. The company intends to handle everything in the line of Miners' and Contractors' Tools and Supplies.

FROM GEO. LEPEY, JR., Union, Ia., who has bought the Hardware, Stove and Plumbing business of H. C. Chapin.

FROM F. L. CARMAN, Hoquiam, Wash., who has succeeded W. Fesenfeld in the Hardware, Stove, Plumbing and Sporting Goods business.

FROM WILLIAMSON HARDWARE COMPANY, Catlettsburg, Ky., successor to Ben Williamson Hardware Company, in the general Hardware, Stove, Implement, Paint and Sporting Goods business.

FROM JULIUS JETKA, Little Falls, Minn., who has withdrawn from the firm of Denis & Jetka and will engage in the Hardware, Stove, Paint and Sporting Goods business under his own name.

FROM THE ENTERPRISE HARDWARE COMPANY, Seattle, Wash., which has been incorporated with a capital stock of \$10,000. The company handles Shelf Hardware, Sporting and Athletic Goods, Tools and Cutlery. New shelving with rolling ladders has been installed throughout the store.

FROM MCCOY HARDWARE COMPANY, Thomas McCoy, proprietor, Jonesboro, Ind., which has bought the general Hardware, Stove, Implement, Paint and Sporting Goods business of the Harris Hardware store.

Squire J. Burrows has succeeded to the business of Burrows & Linder, in Sprague, Wash., and will carry Shelf and Heavy Hardware, Stoves, Tinware, Paints, Oils, Sporting and Athletic Goods and Furniture.

THOMAS' REGISTER OF AMERICAN MANUFACTURERS.

THE THOMAS PUBLISHING COMPANY, 19-21 Park row, New York, has just brought out the third annual edition of "Thomas' Register of American Manufacturers and First Hands in All Lines," containing 2230 pages, each $9\frac{1}{2} \times 3\frac{1}{2}$ in., bound in stiff cloth covers. The publishers claim for the book that it is an alphabetical list of about 40,000 articles, so arranged as to facilitate the instant finding of a wanted commodity; that after the name of each article follows the name of the manufacturers of or first hands in that article with the capital rating of each producer; that it is an index to American manufacturing industries classified, so that an inquirer can readily obtain under any given heading in one place the names, addresses and rating of the manufacturers of or source of supply in any line sought. It is said to contain a total of about 200,000 names, and from its shape and size can be kept in a desk pigeon hole.

PRICE-LISTS, CIRCULARS, Etc.

Manufacturers in Hardware and related lines are requested to send us copies of catalogues, price-lists, &c., for our Catalogue Department in New York; and at the same time to call attention to any new goods or additions to their lines, of which appropriate mention will be made, besides the brief reference to the catalogue or price-list in this column.

CULTER & PROCTOR STOVE COMPANY, Peoria, Ill.: Booklet concerning the Peoria Lexington Steel Ranges and King Bee Air Blast Heaters; also containing valuable suggestions regarding construction and arrangement of chimneys.

MEISTER & COCHRAN, Sterling, Ill.: Card circular illustrating Patent Stove Pipe Radiator for use in connection with Stoves to economize heat and to warm food and water.

PREST HEATING COMPANY, Kansas City, Mo.: Catalogue illustrating and describing the Prest All Cast Flue Radiator Furnaces and other patterns for both coal and wood. Special attention is given to a new Gas Furnace made especially for natural gas.

STAR FURNACE COMPANY, St. Louis, Mo.: Illustrated catalogue descriptive of the Star line of improved Steel Plate Furnaces, patent Convex and Cleanable Registers and Furnace Tools.

C. A. HILES & Co., Chicago, Ill.: Illustrated catalogues representing three separate lines of Tools. Woodworkers' catalogue containing price-list and description of Circular Saws of various kinds, Machine, Shaper, Molding and Planer Knives. Ice Tools catalogue describing and illustrating appliances used in cutting and storage of ice. Butcher Tools catalogue showing a complete assortment of butcher shop equipment.

ECLIPSE MACHINE COMPANY, Elmira, N. Y.: Illustrated catalogue and price-list circular referring to Morrow Coaster and Motor Cycle Brakes, Hubs, Parts, &c.

W. H. GILLETTE, Louisville, Ky.: Catalogue and price-list No. 3, referring to Shafts, Poles, Singletrees, &c.

MONARCH EMERY & CORUNDUM WHEEL COMPANY, Camden, N. J.: Illustrated catalogue of Emery and Corundum Wheels, Special Shapes, Wheels for grinding machinery, Emery Wheel Dressers, &c.

ODORLESS REFRIGERATOR COMPANY, Chattanooga, Tenn.: Catalogues No. 16 and 18, illustrating and describing, respectively, Imperial Odorless and Odorless Solid Oak Refrigerators.

RED JACKET MFG. COMPANY, Davenport, Iowa: Illustrated two-color circular referring to Red Jacket Pump Cylinders and Valves.

MISCELLANEOUS NOTES.

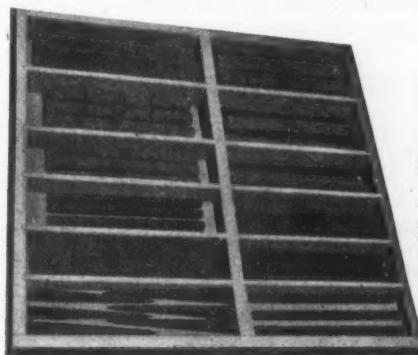
The Butler Company.

The Butler Company, Butler, Ind., is bringing out a complete new line of direct stroke windmills in 8, 10, 12, 14 and 16 in. sizes. The company states that several cars

of these, which have been distributed in the Southwest, are giving entire satisfaction. In connection with its line of medium grade buggies, surreys, &c., the company is also putting on the market a new auto buggy.

File Tray for Small Oilstones.

The accompanying illustration represents a file tray, so-called, which the Pike Mfg. Company, Pike, N. H., has gotten out for the better arrangement and display of a merchant's stock of small India oilstone pieces, such as knife blades, round, triangular, diamond, square and beveled slips, points, &c., which the company is supplying to

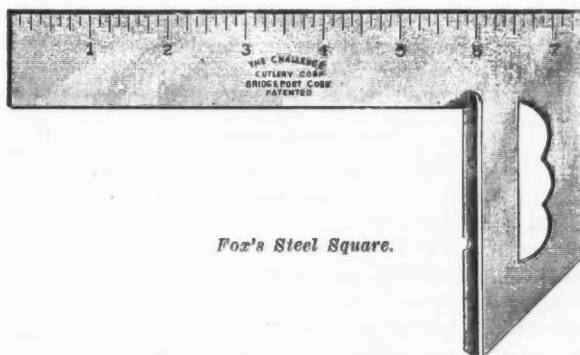


File Tray for Oil Stones.

such trade as makes a specialty of this class of goods. The illustration shows how the stones are arranged. Complete assortments are sold without charge for the trays, which are intended for display in the show case and can also be taken out and placed on the counter or top of show case for closer inspection, the bottom of the tray being padded to protect the glass. The trays are about 12 in. square and made of butternut, natural finish, and lined with a rich shade of billiard cloth.

Fox's All Steel Square.

The Challenge Cutlery Corporation, Bridgeport, Conn., for which Wiebusch & Hilger, Ltd., 9 to 15 Murray street, New York, are sole agents, is just putting on the market an addition to its line of Fox's all steel squares, which is illustrated herewith. This square will be made in two sizes—No. 6, 6-in. blade, head $4\frac{1}{4} \times 1\frac{1}{8}$ in., and No. 7, 6-in. blade,



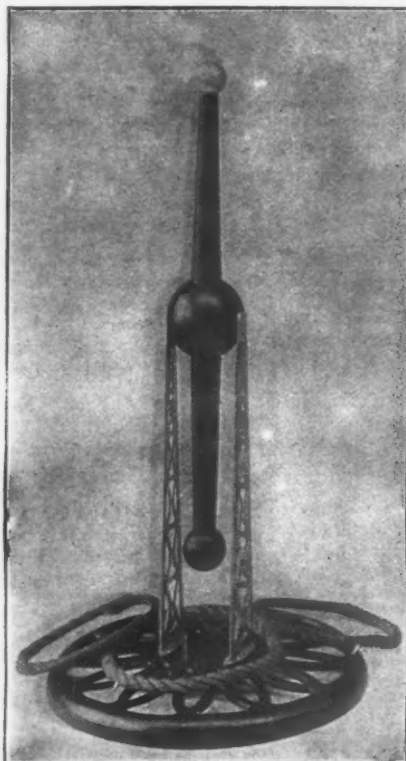
Fox's Steel Square.

head $5 \times 1\frac{1}{2}$ in. They are furnished only in one finish—dull nickel. The flat portion on the inside of the head is held by a special device, which, it is said, makes the square very rigid. These squares will be sold at a popular price, but notwithstanding this they are carefully made, and the manufacturer asserts that they are accurate in measurement and square inside and out.

Kast-A-Ring.

The Maine Wood Novelty Company, 104 Reade street, New York, representing various factories at Fairfield, Skowhegan and Brunswick, Maine, has just put on the market a game called Kast-a-Ring, which may be played on lawn, in gymnasium or elsewhere, and on which

patents are pending. The game consists in casting from a distance of 12 to 15 ft. five rope grommets, or rings, 9 in. in diameter, made of rope $\frac{3}{4}$ in. in diameter, neatly spliced, three of the rings being shown in the illustration. The apparatus consists of a red finished cast iron base of 20 in. in diameter and $2\frac{1}{2}$ in. high, in which is fastened two aluminized uprights, $14\frac{1}{2}$ in. high, which, with ball bearing fittings, support the double ended hard maple arm having a large ball in the center and smaller balls at each end, the arm being 29 in. long and turned from one piece of wood. The center is red, the remaining tapered portions black and the end balls finished natural color. The oscillation of the pendulum like center imparts action and life to the game, and, as the rings are pitched quoitlike under constantly varying conditions, it requires practice, skill and a quick eye to successfully play it. The rings, of stiffened manilla rope, make them



Kast-a-ring for Lawn or Gymnasium.

easy to handle and noiseless, so that the game can be played in doors or out without annoyance to any one. To score the rings must be pitched at just the right angle to drop down as indicated in the position of the center ring.

The Universal Adding Machines.

The adding machines shown in the accompany illustrations are made and marketed by the Universal Adding Machine Company, St. Louis, Mo., which has agencies in many large cities of the country. In construction the machines are said to be superior in every respect containing only the highest grade of material, put together with extreme care and accuracy. A special effort has been made by the manufacturers to reduce the number of parts thus increasing the simplicity and durability of their product. Emphasis is laid on the fact that the Universal will do ordinary work, which may be preserved as an office record as well as mere adding on tape. A wide carriage is therefore provided for the accommodation of loose leaf sheets, &c. Recognizing an advantage in printing totals in a distinctive color so that they cannot be confused with items, this machine is devised to print totals and subtotals in red and items in blue, the ribbon being automatically shifted when the total is taken. Solid steel type is used, permitting a heavy hammer blow without danger of forming a burr edge to interfere with free movement of type. This in connection with a hard

rubber platen permits making three good carbon copies with this machine. To show that the machine was clear when starting a list, it is made possible to print two red naughts before the first item, showing that no amount remained in the machine. Column correction keys are provided so that when an item has been set up on the keyboard, correction can be made without throwing out the entire amount. There is a double action carriage lock, which allows the carriage to be set at regular full carriage distance or at any given point. Any number of



Fig. 1.—Universal Hand Adding Machine.

columns can be made on the sheet, depending upon the length of the items listed. The paper roll is in plain view of the operator, and totals are also clearly seen above the keyboard. A repeat key is automatically restored. Two styles of machines are furnished, one with a hand lever pull, shown in Fig. 1, and the other operated by electricity, shown in Fig. 2. The lever pull is only 5 lb., referred to as exceptionally light. The electric machine can be used wherever electricity is available during business

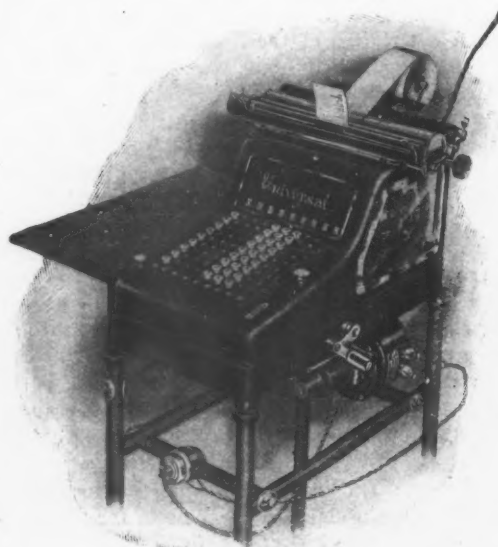


Fig. 2.—Universal Electric Machine.

hours, and requires only the current necessary to run an ordinary electric fan or a 16 c. p. lamp. The plug, which is supplied with the machine, may be screwed into the electric light socket and a button pushed to start the motor; then the adding is done as with a hand machine, but instead of having to pull a lever it is only necessary to push the operating button. A full supply of paper and ribbons is carried by the manufacturers, as well as high and low stands, according to the preference of purchasers.

No. 85 New Giant Hanger.

Lawrence Brothers, Sterling, Ill., have placed on the market a new hanger styled No. 85 New Giant. This hanger is made with a heavy channel steel frame and works on the well-known Hatfield principle. Wide flanges are punched from the cover to give a broad bearing surface for the axle, which rolls along the flanges to

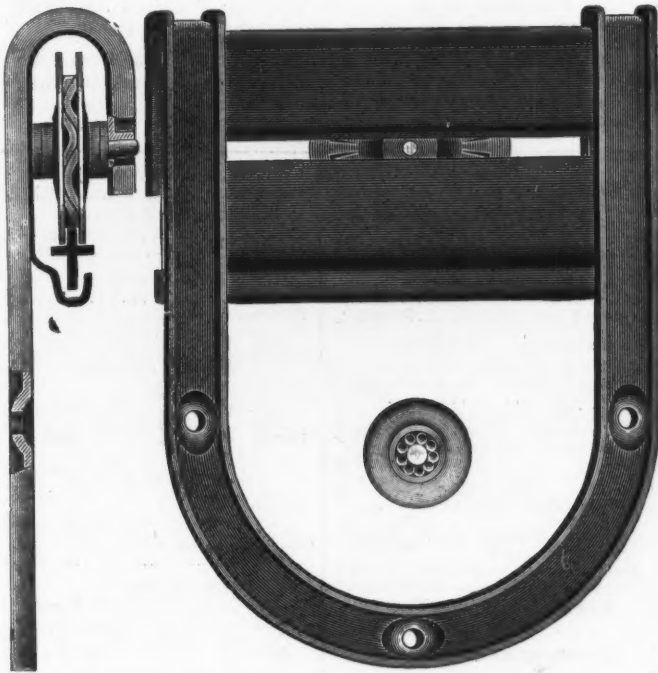


Fig. 1.—Side View.

Fig. 2.—Front View.

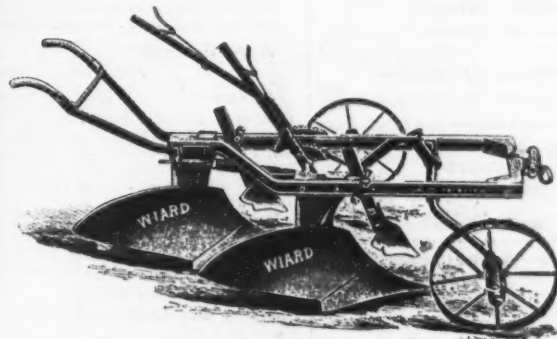
No. 85 New Giant Hanger.

the end of the runway. Then the axle stops and the wheel turns freely upon it on roller bushings, making an endless run without wear or friction on the frame. It is said to be impossible to derail this hanger on account of the hook, which extends the full width. The hanger is referred to as exceptionally strong and easy running, be-

ing especially designed for large barn and warehouse doors.

Wiard Two-Furrow Walking Gang Plow.

The plow here illustrated is made by Wiard Plow Company, Batavia, N. Y. It is two-furrow and cuts 22 in., 4 to 8 in. deep. The frame is constructed of high carbon steel, braced so as to be very rigid. The standards or main part of the plow bottoms are made so as to afford the greatest strength without unnecessarily adding to the weight. The wheels have adjustable wearing parts and dustproof bearings. Levers are adjustable to suit all soils and conditions and the clevis is strong and adapted to all adjustments. Shinpieces and landslides



Wiard Two-Furrow Walking Gang Plow.

are chilled iron and points are cast iron, plain or cutter, while moldboards are made of chilled or soft center steel, as ordered. It is claimed that the plow will run alone, the operator simply guiding the team; also that levers and wheels are so arranged that by means of a spring lift and the assistance of the horses the plows are easily raised out of the ground. Plows can be rigged with jointers, plain colters or rolling colters as wanted. They are made in right or left hand and are adapted to use with three or four horses abreast, the plow weighing with clevis 360 lb. It is asserted that with three horses and one man they will do the work usually requiring four horses and two men.

PAINTS, OILS AND COLORS

Animal, Fish and Vegetable Oils—

Animal, Fish and Vegetable Oils—	per gal.
Linseed, City, raw.....	48 @49
City, Boiled.....	49 @50
State and Western, raw.....	47 @48
Raw, Calcutta, in bbls.....	70 @..
Lard, Extra Prime, Winter.....	74 @77
Extra No. 1.....	54 @57
No. 1.....	50 @53
Cotton-seed, Crude, f.o.b. mills.....	33 @34
Summer Yellow, Prime.....	52 @53 1/2
Summer White.....	56 @56 1/2
Yellow Winter.....	56 @56
Sperm, Crude.....	59 @60
Natural Winter.....	72 @73
Bleached Winter.....	75 @76
Bleached Winter, Extra.....	76 @76
Tallow, Prime.....	62 @64
Whale, Crude.....	35 @36
Natural Winter.....	48 @49
Bleached Winter.....	50 @51
Extra Bleached Winter.....	52 @53
Menhaden, Brown, Strained.....	38 @..
Light Strained.....	38 @..
Northern.....	38 @..
Southern.....	38 @..
Cocanut, Ceylon.....	74 @ 74 1/2
Cochin.....	9 @ 9 1/2
Cod, Domestic, Prime.....	38 @40
Newfoundland.....	42 @44
Red, Elaine.....	46 @49
Saponified.....	46 @49
Olive, Italian, bbls., Yellow.....	75 @80
Neatsfoot, Prime.....	56 @57
Palm, Lagos.....	64 @ 64 1/2

Mineral Oils—

Mineral Oils—	per gal.
Black, 29 gravity, 25@30 cold test.....	12 1/2 @13
29 gravity, 15 cold test.....	13 @13 1/2
Summer.....	12 @12 1/2
Cylinder, light filtered.....	19 @20
Dark, filtered.....	16 1/2 @17 1/2
Paraffine, 903-907 gravity.....	14 @14 1/2
903 gravity.....	13 @13 1/2
903 gravity.....	10 1/2 @11 1/2
Red.....	15 @14 1/2

Miscellaneous—

Miscellaneous—	per 100 lb.
Barytes:	
White, Foreign.....	18.50 @20.50
Amer. floated.....	19.00 @20.00
Off color.....	13.00 @16.50
Chalk, in bulk.....	3.00 @ 3.25
In bbls.....	100 lb @ 35
China Clay, Imported.....	11.00 @17.50
Cobalt, Oxide.....	100 lb 2.50 @ 2.60
Whiting, Commercial.....	100 lb .43 @ .52
Gilders.....	100 lb .55 @ .65
Ex. Gilders.....	100 lb .60 @ .65
Putty, Commercial.....	100 lb
In bladders.....	\$1.70 @1.85
In bbls. or tubs.....	1.20 @1.45
In 1 lb to 5 lb cans.....	2.65 @2.95
In 12 1/2 to 50 lb cans.....	1.50 @1.90
Spirits Turpentine.....	per gal.
In Oil bbls.....	54 1/2 @55
In machine bbls.....	54 1/2 @55 1/2
Glue—	
Cabinet.....	12 @15
Common Bone.....	7 1/2 @ 9
Extra White.....	18 @24
Foot Stock, White.....	12 @14
Foot Stock, Brown.....	9 @11
German Hide.....	12 @18
French.....	10 @16
Low Grade.....	10 @12
Medium White.....	14 @17
Gum Shellac—	
Bleached, Commercial.....	35 @38
Bone Dry.....	45 @48
Button.....	40 @50
Diamond I.....	55 @55
Fine Orange.....	45 @50
A. C. Garnet.....	42 @43
G. A. L.....	35 @36
Kala Button.....	23 @25
D. C.....	56 @57
Octagon B.....	51 @52
T. N.....	33 @35
V. S. O.....	53 @55
Colors in Oil—	
Black, Lampblack.....	12 @14
Blue, Chinese.....	36 @46

Colors in Oil—	per 100 lb.
Blue, Prussian.....	32 @36
Blue, Ultramarine.....	13 @16
Brown, Vandyke.....	11 @14
Green, Chrome.....	12 @16
Green, Paris.....	12 @24
Sienna, Raw.....	12 @15
Sienna, Burnt.....	12 @15
Umber, Raw.....	11 @14
Umber, Burnt.....	11 @14

White Lead, Zinc, &c.—

White Lead, Zinc, &c.—	per 100 lb.
Lead, English white, in Oil.....	10 1/2 @10 1/2
Lead, American White:	
Lots of 500 lb or over, in Oil.....	@ 7
Lots less than 500 lb, in Oil.....	@ 7 1/2
Lead, White, in oil, 25 lb tin	
pails, add to keg price.....	@ 1/4
Lead, White, in oil, 12 1/2 lb tin	
pails, add to keg price.....	@ 1
Lead, White, in oil, 1 to 5 lb	
ass'ted tins, add to keg price.....	@ 1 1/4
Lead, American, Terms: For lots 12	
tons and over 1/4% rebate; and 2% for	
cash if paid in 15 days from date of	
invoice; for lots of 500 lbs. and over	
2% for cash if paid in 15 days from	
date of invoice, for lots of less than	
500 lbs. net.....	5 1/2 @ 5 1/2
Zinc, American, dry.....	5 1/2 @ 5 1/2
Antwerp, Red Seal, dry.....	8 1/2
Antwerp, Green Seal, dry.....	10 1/2
Paris, Red Seal, dry.....	9 1/2
Paris, Green Seal, dry.....	11
Zinc, V. M. French, in Poppy Oil:	
Green Seal:	
Lots of 1 ton and over.....	13 1/2 @13 1/2
Lots of less than 1 ton.....	13 1/2 @13 1/2
Discounts—French Zinc—Discounts	
to buyers of 10 bbl. lots of one or mixed	
grades, 1%: 25 bbls., 2%: 50 bbls., 4%:	
Red Seal:	
Lots of 1 ton and over.....	11 1/2 @12 1/2
Lots of less than 1 ton.....	12 1/2 @12 1/2
Discounts—French Zinc—Discounts	
to buyers of 10 bbl. lots of one or mixed	
grades, 1%: 25 bbls., 2%: 50 bbls., 4%:	
Dry Colors—	
Black, Carbon.....	6 1/2 @10
Black Drop, American.....	3 1/2 @ 8
Black Drop, English.....	5 @15

Colors in Oil—	per 100 lb.
Black, Ivory.....	16 @20
Lamp, commercial.....	4 @ 6
Blue, Celestial.....	4 @ 6
Blue, Chinese.....	30 @33
Blue, Prussian.....	28 @32
Blue, Ultramarine.....	34 @35
Brown, Spanish.....	1/2 @ 1
Carmine, No. 40.....	33.00 @35
Green, Chrome, ordinary.....	3 1/2 @ 5
Green, Chrome, pure.....	17 @25
Lead, Red, bbls., 1/2 bbls., kegs.....	@ 7 1/4
Litharge, bbls., 1/2 bbls., kegs.....	@ 7 1/4
Ocher, American.....	10 @14 00
American Golden.....	2 1/2 @ 3 1/4
French.....	1 1/2 @ 2
Foreign Golden.....	3 @ 4
Orange Mineral, English.....	10 @12
French.....	11 1/2 @12
German.....	10 @12
American.....	8 1/2 @ 9
Red, Indian, English.....	4 1/2 @ 6
American.....	3 @ 3 1/4
Red, Turkey, English.....	4 @10
Red, Tuscan, English.....	7 @10
Red, Venetian, Amcr.....	100 lb \$0.50 @1.25
English.....	100 lb \$1.15 @1.50
Sienna, Italian, Burnt and	
Powdered.....	3 @ 9
Italian, Raw, Powdered.....	3 @ 7
American, Raw.....	1 1/2 @ 2
American Burnt and Pow'd.....	1 1/2 @ 2
Talc, French.....	100 lb \$18.00 @25.00
American.....	100 lb 15.00 @25.00
Terra Alba, French.....	100 lb 9.00 @ 1.00
English.....	100 lb 8.00 @ 1.00
American.....	100 lb 7.50 @ 8.00
American.....	100 lb 6.00 @ 6.50
Umber, They Bnt. & Pow'd.....	2 @ 3 1/4
Turkey, Raw and Powdered.....	2 1/2 @ 3 1/4
Burnt, American.....	1 1/2 @ 2
Raw, American.....	1 1/2 @ 2
Yellow Chrome, Pure.....	12 @14
Vermilion, American Lead.....	7 @25
Quicksilver, bulk.....	65 @..
Quicksilver, bars.....	65 @..
English, Imported.....	65 @..
Chinese.....	\$0.90 @1.00

Current Hardware Prices.

General Goods.—In the following quotations General Goods—that is, those which are made by more than one manufacturer—are printed in *Italics*, and the prices named, unless otherwise stated, represent those current in the market as obtainable by the fair retail Hardware trade, whether from manufacturers or jobbers. Very small orders and broken packages often command higher prices, while lower prices are frequently given to larger buyers.

Special Goods.—Quotations printed in the ordinary type (Roman) relate to goods of particular manufacturers, who are responsible for their correctness. They usually represent the prices to the small trade, lower prices being obtainable by the fair retail trade, from manufacturers or jobbers.

Range of Prices.—A range of prices is indicated by means of the symbol @. Thus 33% @ 33% & 10% signifies

that the price of the goods in question ranges from 33% per cent. discount to 33% and 10 per cent. discount.

Names of Manufacturers.—For the names and addresses of manufacturers see the advertising columns and also THE IRON AGE DIRECTORY, issued May, 1907, which gives a classified list of the products of our advertisers and thus serves as a DIRECTORY of the Iron, Hardware and Machinery trades.

Standard Lists.—"The Iron Age Standard Hardware Lists" contains the list prices of many leading goods.

Additions and Corrections.—The trade are requested to suggest any improvements with a view to rendering these quotations as correct and as useful as possible to Retail Hardware Merchants.

Adjusters, Blind—

Columbian and Domestic.....33%
North's.....10%
Zimmerman's—See Fasteners, Blind.

Window Stop—

Ives' Patent.....35%
Taplin's Perfection.....35%

Ammunition—See Caps, Cartridges, Shells, &c.

Anti-Rattlers—

Fernald Mfg. Co. Burton Anti-Rattlers, 3 doz. pairs, No. 1, \$2.75; 2, \$2.00; 4, \$1.00; 5, \$0.50.
Fernald Quick Shifter, 3 doz. pairs.....\$2.00@3.00

Anvils—American—

Eagle Anvils.....\$10.00@15.00
Hay-Budden, Wrought.....\$10.00@15.00
Trenton.....\$10.00@15.00

Imported—

Peter Wright & Sons, 10 lb. to 310 lb., 11¢; 350 to 600 lb., 11½¢.

Anvil, Vise and Drill—

Millers Falls Co., \$18.00.....15¢10%

Apple Parers—See Parers, Apple, &c.

Aprons, Blacksmiths—

Livingston Nail Co.....33%4%

Augers and Bits—

Com. Double Spur.....75¢@80%
Jennings' Pat., Bright, 65¢10¢70%
Black Lip or Blued.....65¢65¢5%
Boring Mach. Augers.....70%
Car Bits, 12-in. twist.....40¢10%
Ford's Auger and Car Bits.....40¢5%
Ft. Washington Auger Co., Concord's.....35%
Forester Pat. Auger Bits.....35%
C. E. Jennings & Co., No. 10 ext. lip, R. Jennings' list, 25¢7½%
No. 30, R. Jennings' list.....25¢10¢2%
Russell Jennings.....25¢10¢2%
L'Hommedieu Car Bits.....25%
Mayhew's Countersink Bits.....25%
Fugh's Black Auger Bits.....25%
Pugh's Jennings' Pattern.....25%
Snell's Auger Bits.....25%
Snell's Bell Hangers' Bits.....25%
Snell's Car Bits, 12-in. twist.....25%
Snell's King Auger Bits.....25%
Wright's Jennings' Bits.....25%

Bit Stock Drills—

See Drills, Twist.

Expansive Bits—

Clark's Pattern, No. 1, 3 doz. \$2.10; No. 2, \$1.80.....\$2.10@2.50%
Ford's, Clark's Pattern.....65¢5%
C. E. Jennings & Co., Steer's Pat., 25¢
Lavigne Pat., small size, \$18.00; large size, \$20.00.....\$18.00@20.00%
Swan's.....60%

Gimlet Bits—

Common Dble. Out.....\$3.00@3.25

German Pattern, Nos. 1 to 10, \$1.75; 11 to 15, \$1.75

Hollow Augers—

Bonney Pat., per doz.....\$6.50@7.00

Ames.....\$2.10@2.50%
Universal.....20%

Ship Augers and Bits—

Ship Augers.....40¢10%
Ford's.....33%5%
C. E. Jennings & Co., L'Hommedieu's.....6%
Watrous'.....33%4%
Snell's.....40%

Awl Hafts—See Handles, Mechanics' Tool.

Awls—

Brad Awls:

Handled.....gro. \$2.75@3.00

Unhanded, Shlided.....gro. \$3.00@3.50

Unhanded, Patent.....gro. \$3.00@3.50

Scratch Awls:

Handled, Com.....gro. \$3.50@4.00

Handled, Socket.....gro. \$11.50@12.00

Awl and Tool Sets—See Sets, Awl and Tool.

Axes—

Single Bit, base weights: Per doz.

First Quality.....\$1.75@2.00

Second Quality.....\$1.25@1.50

Double Bit, base weights:
First Quality.....\$7.00@7.50
Second Quality.....\$6.50@6.75

Axle Grease—

See Grease, Axle

Axles—

Concord, Loose Collar.....4½¢5¢

Concord, Solid Collar.....4½¢5¢

No. 1 Common, Loose.....3½¢4½¢

No. 1½ Com., New Style.....4½¢5¢

No. 2 Solid Collar.....4½¢5¢

Half Patent:

Nos. 7, 8, 11 and 12.....65¢@65¢10%

Nos. 13 to 14.....65¢@65¢10%

Nos. 15 to 18.....70¢@70¢10%

Nos. 19 to 22.....70¢@70¢10%

Boxes, Axle—

Common and Concord, not turned lb., 5¢6¢

Common and Concord, turned lb., 6¢7¢

Half Patent.....lb., 9½¢10¢

Bait—

Fishing—

Hendryx:

A Bait.....20%

B Bait.....25%

Competitor Bait.....20¢5%

Balances—

Sash—

Caldwell new list.....50%

Pullman.....50¢10¢00%

Spring—

Spring Balances.....50¢10¢00%

Chatillon's:

Light Sps. Balances.....50¢50¢10%

Straight Balances.....10¢10¢10%

Circular Balances.....50¢10%

Large Dial.....30%

Barb Wire—See Wire, Barb.

Bars—

Crow—

Steel Crowbars, 10 to 40 lb. per lb. @ 2½¢3½¢

No. 10 Ideal, Nickel Plate.....\$1.00

Beams, Scale—

Scale Beams.....40%

Chatillon's No. 1.....30%

Chatillon's No. 2.....40%

Beaters, Carpet—

Holt-Lyon Co.:

No. 12 Wire Coppered 3 doz. \$0.80;

Tinned.....\$0.85

No. 11 Wire Coppered 3 doz. \$1.15;

Tinned.....\$1.20

No. 10 Wire Tinned.....3 doz. \$1.50

Beaters, Egg—

Holt-Lyon Co.:

Holt, per doz., No. 5, Jap'd, \$0.80;

No. A, Jap'd, \$1.15; No. B, Jap'd, \$1.85;

No. C, Jap'd, \$1.65.

Lyon, Jap'd, per doz., No. 2, \$1.30.

Taplin Mfg. Co.:

Improved Dover, per gro., No. 60, \$4.00; No. 75, \$4.50; No. 100, \$5.00;

No. 102, Tin'd, \$6.50; No. 152, Hotel, \$15.00; No. 200, Tumbler, \$17.00;

No. 202, Tumbler Tin'd, \$19.50; No. 300, Mammoth, per doz., \$25.00.

Turner & Seymour Mfg. Co.: T. & S. Dover.....\$6.50

Bellows—

Blacksmith, Standard List.

Split Leather.....60¢10¢65%

Grain Leather.....50¢50¢10%

Hand—

Inch.....6 7 8 9 10

Doz. \$5.00 5.50 6.00 6.50 7.50

Molders—

Inch.....10 12 14 16

Doz. \$7.50 9.00 12.00 15.00

Bells—

Cow—

Ordinary Goods.....75¢@75¢10¢5%

High grade.....70¢10¢75%

Jersey.....75¢10%

Texas Stat.....50%

Door—

Home, R. & E. Mfg. Co.'s.....35¢10%

Hand—

Polished, Brass.....50¢@50¢10%

White Metal.....50¢@50¢5%

Nickel Plated.....50%

Swiss.....50%

Cone's Globe Hand Bells.....33%@35%

Miscellaneous—

Farm Bells.....lb., 2½¢@2½¢

Church and School.....60¢@60¢5%

Belting—

Leather—

Extra Heavy, Short Lap.....60¢5%

Regular Short Lap.....60¢10¢5%

Standard.....70¢5%

Light Standard.....75%

Out Leather Lacing.....40¢5%

Leather Lacing Slides, per sq. ft. 25¢

Rubber—

Agricultural (Low Grade).....75¢@75¢5%

Common Standard.....70¢@70¢10%

Standard.....70¢@70¢5%

Extra.....60¢5¢@60¢10%

High Grade.....50¢5¢@50¢10%

Bench Stops—

See Stops, Bench

Benders and Upsetters, Tire—

Green River Tire Benders and Upsetters.....20%

Bicycle Goods—

John S. Leng's Son & Co.'s 1907 list:

Chain, Parts, Spokes.....50%

Tubes.....60%

Bits—

Auger, Gimlet, Bit Stock Drills, &c.—See Augers and Bits.

Blocks—

Tackle—

Common Wooden.....75%

B. & L. B. Co.:

Boston Wood Snatch, 50%; Eclipse Steel, 75%; Hollow Steel, 60¢10%;

Star Wire Rope, 80%; Tarbox Metal Snatch, 50%; Tarbox New Style Steel, 50¢10%;

Wire Rope Snatch, 50%.

Lane's Patent Automatic Lock and Junior.....30%

See also Machines, Hoisting.

Boards, Stove—

Paper and Wood Lined.....40%

Embossed.....50%

Boards, Wash—

See Washboards.

Bobs, Plumb—

Keuffel & Esser Co.....35¢45%

Bolts—

Carriage, Machine, &c.—

Common Carriage (cut thread):

¾ x 6 and smaller.....70¢5¢@—

Larger and longer.....65¢@—

Phila. Eagle, \$3.00 list.....80¢@—

Bolt Ends.....65¢5¢@—

Machine (Cut Thread):

¾ x 4 and smaller.....70¢7½¢@—

Larger and longer.....65¢5¢@—

Door and Shutter—

Cast Iron Barrel, Japanned, Round Brass Knob:

Inch.....3 4 5 6 8

Per doz. \$0.30 .35 .45 .60 .80

Cast Iron Spring Foot, Jap'd:

Inch.....6 8 10

Per doz. \$1.20 1.50 2.25

Cast Iron Chain, Flat, Japanned:

Inch.....6 8 10

Per doz. \$1.00 1.40 1.95

Cast Iron Flat Shutter, Jap'd., Brass Knobs:

Inch.....6 8 10

Per doz. \$0.75 .85 1.25

Wrought Barrel Jap'd.....80¢@80¢10%

Barrel Bronzed.....60¢10%

Spring.....70¢10¢@70¢10¢10%

Shutter.....50¢5¢@50¢10¢5%

Square Neck.....75¢@75¢10%

Square.....70¢10¢10%

Ives' Patent Door.....35%

Ives' Wrought Metal.....65%

Expansion—

Richards Mfg. Co.....50¢10%

Plow and Stove—

Plow.....65¢5¢@—

Stove.....85¢@85¢5%

Tire—

Common Iron.....80%

Norway Iron.....80%

American Screw Company:

Norway Phila., list Oct. 15, '04.....80%

Eagle Phila., list Oct. 15, '04.....82½%

Bay State, list Dec. 28, '00.....80%

Franklin Moore Co.:

Norway Phila., list Oct. 15, '04.....80%

Eagle Phila., list Oct. 15, '04.....82½%

Eclipse, list Dec. 28, '00.....80%

Russell, Burdall & Ward Bolt & Nut Co.:

Empire, list Dec. 28, '00.....80%

Norway Phila., list Oct. '04.....80%

Eagle.....82½%

Shelton Co.:

Tiger Brand, list Dec. 28, '00.....80%

Hendryx Bronze, Series 700, 800, 30%
Hendryx Enamelled.....35%

Calipers—See Compasses.**Calks, Toe and Heel—**

Blunt, 1 prong, per lb. 4¢ @ 4¢
Sharp, 1 prong, per lb. 4¢ @ 5¢
Burke's, Blunt, 4¢ @ 4¢; Sharp, 4¢ @ 4¢
Lautier, Blunt, 4¢ @ 4¢; Sharp, 4¢ @ 4¢
Perkins', Blunt, 4¢ @ 4¢; Sharp, 4¢ @ 4¢

Can Openers—

See Openers, Can.

Caps, Percussive—

Elroy's E. B. 68¢ @ 55¢
G. D. per M 34¢ @ 35¢
F. L. per M 40¢ @ 42¢
G. E. per M 48¢ @ 50¢
Musket per M 62¢ @ 64¢

Primers—

Berdan Primers, 32 per M. 20¢ @ 5¢
Primer Shells and Bullets.....15¢ @ 10¢
All other primers per M. \$1.50 @ \$1.60

Carpet Stretchers—

See Stretchers, Carpet.

Cartridges—

Blank Cartridges:

32 O. F., \$5.50 10¢ @ 5¢
38 O. F., \$7.00 10¢ @ 5¢
32 cal. Rim, \$1.50 10¢ @ 5¢
32 cal. Rim, \$2.75 10¢ @ 5¢
B. B. Caps, Con. Ball, Sigd. \$1.50
B. B. Caps, Round Ball \$1.49
Central Fire 25¢
Target and Sporting Rifle 15¢ @ 5¢
Primer Shells and Bullets.....15¢ @ 10¢
Rim Fire, Sporting 50¢
Rim Fire, Military 15¢ @ 5¢

Casters—

Bed 65¢ @ 10¢
Plate 60¢ @ 5¢
Philadelphia 70¢ @ 10¢
Acme, Ball Bearing 35¢
Gem (Roller Bearing) 70¢ @ 10¢ @ 5¢
Steel Gem 20¢
Standard Ball Bearing 45¢
Yale (Double Wheel) low list. 40¢ @ 10¢

Cattle Leaders—

See Leaders, Cattle.

Chain, Proof Coil—

American Coil, Straight Link:
3-16 1/4 5-16 3/4 7-16 1/2 9-16
\$8.77 6.17 5.02 4.57 4.37 4.27 4.22
% 1/2 3/4 1 1 1/4 1 1/2 1 3/4 inch.
\$4.77 4.07 4.02 4.12
In case lots, deduct 25¢.

German Coil:
6-0 to 1 70¢ @ 5¢ @ 10¢
2 and 3, 20 to 100 60¢ @ 10¢ @ 5¢
4, 5 and 6 50¢ @ 10¢ @ 5¢

Halter—

Halter Chains 60¢ @ 60¢ @ 5¢
German Pattern Halter Chains,
list July 24, '97 60¢ @ 10¢ @ 5¢
Covert Mfg. Co. 35¢ @ 5¢
Halter 35¢ @ 5¢

Cow Ties—

See Halters and Ties.

Trace, Wagon, &c.—

Traces, Western Standard: 100 pr.
6 1/2-6 3/4, Straight, with ring, \$28.00
6 1/2-6 3/4, Straight, with ring, \$29.00
6 1/2-6 3/4, Straight, with ring, \$32.00
6 1/2-10-2, Straight, with ring, \$37.00
NOTE.—Add 2c per pair for Hooks.
Twist Traces: add per pair for Nos. 2
and 3, 2c; No. 1, 3c; No. 4, 4c to price of
Straight Link.

Eastern Standard Traces, Wag-
on Chain, &c. 60¢ @ 10¢ @ 5¢

Miscellaneous—

Jack Chain, list July 10, '95:
Iron 60¢ @ 10¢
Brass 60¢
Safety and Plumbers' Chain, 60¢ @ 10¢
Gal. Pump Chain 10¢ @ 4¢ @ 1/4¢
Covert Mfg. Co.:
Breast, Halter, Heel, Rein, Stal-
lion 40¢
Onoda Community:
American Halter, Dog and Kennel
Chains 35¢ @ 2¢ @ 40¢
Niagara Dog Leads and Kennel
Chains 45¢ @ 60¢ @ 5¢
Wire Goods Co.:
Dog Chain 70¢
Universal Dbl.-Jointed Chain 50¢

Chain and Ribbon, Sash—

Onoda Community:
Steel Chain 60¢
Pullman:
Bronze Chain, 60%; Steel Chain, 60¢ @ 10¢
Sash Chain Attachments, per set, 1.4
Aluminum Sash Ribbon, per 100
ft. \$1.25 @ \$3.00
Sash Ribbon Attachments, per set, 8¢

Chalk—(From Jobbers.)

Carpenters' Blue gro., 50¢ @ 55¢
Carpenters' Red gro., 45¢ @ 50¢
Carpenters' White gro., 40¢ @ 45¢

Checks, Door—

Barclay's 45¢
Pullman, per gro. 54.00
Russwin 35¢ @ 7¢

Chests, Tool—

American Tool Chest Co.:
Boys' Chests, with Tools 50¢
Youths' Chests, with Tools 35¢
Gentlemen's Chests, with Tools 25¢
Farmers', Carpenters', etc., Chests,
with Tools 20¢
Mechanists' and Pipe Fitters'
Chests, Empty 45¢
Tool Cabinets 45¢
C. E. Jennings & Co.'s Machinists'
Tool Chests 75¢

Chisels—

Socket Framing and Firmer

Standard List 75¢ @ 10¢
Huck Bros. 30¢
C. E. Jennings & Co.:
Socket Firmer No. 10 25¢ @ 74¢
Socket Framing No. 15 25¢ @ 74¢
Swan's 65¢ @ 70¢
L. & I. J. White Co. 30¢ @ 30¢ @ 5¢

Tanged—

Tanged Firmers 30¢ @ 35¢
Huck Bros. 30¢
C. E. Jennings & Co. Nos. 191, 181, 25
L. & I. J. White Co. 25¢ @ 3¢

Cold—

Cold Chisels, good quality, 15¢ @ 15¢
Cold Chisels, fair quality, 11¢ @ 12¢
Cold Chisels, ordinary 9¢ @ 10¢

Chucks—

Almond Drill Chucks 35¢
Almond Turret Six-Tool Chuck 40¢
Beach Pat., each \$3.00 35¢ @ 5¢
Empire 25¢
Blacksmiths' 25¢
Jacobs' Drill Chucks 35¢
Hart's Positive Drive 25¢
Skinner Patent Chucks:
Independent Lathe Chucks 35¢
Universal, Reversible Jaws 35¢
Combination, Reversible Jaws 35¢
Drill Chucks, New Model, 25¢:
Standard, 45¢; Skinner Pat.,
25¢; Positive Drive 40¢
Planer Chucks 30¢
Face Plate Chucks 35¢
Standard Tool Co.:
Improved Drill Chuck 45¢
Union Mfg. Co.:
Combination, Nos. 1, 2, 3, 4, 5, 6,
7, 8 and 17, 40%; No. 21 35¢
Scroll Combination, Nos. 83 and
84 30¢
Geared Scroll, Nos. 33, 34 and 35, 25¢
Independent Iron, Nos. 18 and 318, 35¢
Independent Steel, No. 61 25¢
Union Drill, Nos. 000, 00, 100, 101,
102, 103, 104 35¢
Union Gear Drill 25¢
Universal, 11, 12, 16, 17, 13, 14, 15, 40%
Universal, No. 42 35¢
Iron Face Plate Jaws, Nos. 22, 30,
48 and 50 35¢
Steel Face Plate Jaws, Nos. 70 and
72 50¢
Westcott Patent Chucks:
Lathe Chucks 50¢
Little Giant Lathe Drill 50¢
Little Giant Double Grip Drill 50¢
Little Giant Drill, Improved 50¢
Oneida Drill 50¢
Scroll Combination Lathe 50¢

Clamps—

Adjustable, Hammers' 20¢ @ 20¢ @ 5¢
Carriage Makers', P., S. & W. 50¢ @ 10¢
Besly, Parallel 35¢ @ 10¢
Myers' Hay Rack 45¢
Lineman's Swedish Nevertum 65¢
Wood Workers', Hammers' 40¢ @ 10¢
Saw Clamps, see Vises, Saw Filers'.

Cleaners, Drain—

Iwan's Champion, Adjustable 50¢
Iwan's Champion, Stationary 40¢

Sidewalk—

Star Socket, All Steel, 3/4 doz. \$4.05 net
Star Shank, All Steel, 3/4 doz. \$3.24 net
W. & C. Shank, All Steel, 3/4 doz.,
7 1/4 in., \$3.00; 5 in., \$3.25.

Cleavers, Butchers'—

Foster Bros. 30¢
Fayette R. Plumb 30¢
L. & I. J. White Co. 30¢

Clippers, Horse and**Sheep—**

Chicago Flexible Shaft Company:
1902 Chicago Horse, each, \$10.75
20th Century Horse, each, \$5.00
Lightning Belt Horse, each, \$15.00
Chicago Belt Horse, each, \$20.00
Stewart's Enclosed Gear
Horse, each \$8.75
Stewart's Patent Sheep Shear-
ing Machine, each \$12.75
Stewart Enclosed Gear Shear-
ing Machine, No. 8, each, \$9.75

Clips, Axle—

Regular Styles, list July 1, '05,
80¢ @ 80¢ @ 10¢

Cloth and Netting, Wire**—See Wire, &c.****Cocks, Brass—**

Hardware list:
Plain Bibbs, Globe, Kerosene,
Racking, Liquor, Bottling,
&c. 70¢ @ 9¢
Compression Bibbs, 60¢ @ 10¢ @ 5¢

Coffee Mills—

See Mills, Coffee.

Collars, Dog—

Nickel Chain, Walter B. Stevens &
Son's list 40¢
Leather, Walter B. Stevens & Son's
list 40¢

Compasses, Dividers, &c.

Ordinary Goods, 70¢ @ 10¢ @ 75¢
Wm. Schellhorn Co.:
Excelsior Dividers 60¢
Lodi Dividers 70¢ @ 10¢

Conductor Pipe,—

L. C. L. to Dealers:

Galv.	Charcoal	Copper
Steel.	Iron.	14, 16 & 20 oz.
Eastern:		
70%	50¢ @ 17 1/2%	30¢ @ 10%
Central:		
70¢ @ 5%	60%	30¢ @ 10%
Western and Southern:		
70%	55¢ @ 5%	30¢ @ 7 1/2%
No. Western		
65¢ @ 5%	50¢ @ 5%	30¢ @ 5%

Terms, 60 days; 2% cash 10 days. Fac-
tory shipments generally delivered.
See also Eave Troughs.

Coolers, Water—

L. & G. Mfg. Co.:
Gal. 2 3 4 6 8
Galvanized, ea. \$1.35 \$2.00 \$2.25 \$2.90 \$3.90
Galvanized, Lined, side handles,
Gal. 2 3 4 6 8
Each \$1.95 \$2.15 \$2.40 \$3.30 \$4.15
White Enamelled 10¢
Agate Lined 10¢

Coopers' Tools—

See Tools, Coopers'.

Coppers' Soldering—

Soldering Coppers, 3 lbs. to pair
and heavier, 30¢ @ 32¢; lighter
than 3 lb. to pair 32¢ @ 35¢

Cord— Sash—

Braided, Drab lb. 35¢
Braided, White, Com., Nos. 8
to 12, 26¢; No. 7, 26 1/4¢; No. 6,
27 1/4¢.
Cable Laid Italian, lb., No. 18, 37¢
Italian, lb., A, No. 18, 35¢; B, 32¢
Common India lb., 11¢ @ 11 1/4¢
Cotton Sash Cord, Twisted, 18¢ @ 20¢
Patent Russia lb. 20¢
Cable Laid Russia lb. 21¢
India Hemp, Br'd'd lb. 21¢
India Hemp, Twisted lb. 13¢ @ 14¢
Patent India, Twisted lb. 17¢
Pearl Braided, cotton, No. 6, 3¢ lb.
27 1/4¢; No. 7, 26 1/4¢; Nos. 8 to 12, 26¢
Edystone, Braided, Nos. 8 to 12,
26 1/4¢; 7, 26 1/4¢; 6, 27 1/4¢.
Harmony Cable Laid Italian, Nos. 7
to 10 lb. 23¢
Fullman:
Wire Sash Cord 18¢
Sash Cord Attachments, per doz. 10¢
Samson, Nos. 8 to 12:
Braided, 18¢; Drab Cotton,
55¢; Italian, 40¢ @ 45¢
50¢; Linen, 65¢; White Cotton,
50¢; Spot Cord 50¢
Massachusetts, White lb. 40¢
Massachusetts, Drab lb. 45¢
Phoenix, White, Nos. 8 to 12, 27¢
Silver Lake, per lb.:
A, Drab, 40¢; A, White, 40¢
B, Drab, 40¢; B, White, 35¢
Italian Hemp, 40¢; Linen 57 1/4¢
See also Chain and Ribbon.

Wire, Picture—

List July 10, 1906 90¢ @ 90¢
Hendryx Standard Wire Picture Cord,
old list, 85¢ @ 10¢
Turner & Stanton Co. Wire Picture
Cord 85¢ @ 10¢

Cradles—

Grain 40¢ @ 12 1/2%

Crayons—

White Round Crayons, Cases, 100
gro., \$8.50 @ \$7.50 at factory, but
lower prices made by jobbers
Zelnicke's Lumber, 7¢ gro.
White and Purple, Indelible, 7¢ 50
Blue, Red, Green, Yellow and
Terra Cotta, 6¢ 50; Black 4¢ 00
Giant Lumber, 5 1/4 in. x 15-16 in.
round, all colors, \$16.25; Indeli-
bles \$18.75
Genuine Soapstone, Metal Workers',
5 in. x 1 1/4 in. Round, \$2.50; 5 in. x
1 1/4 in. Square, \$1.75; 5 x 1 1/4 x 3-16,
\$2.50; 5 x 1 1/4 x 1-16 \$3.00

Crooks, Shepherds'—

Fort Madison, per doz., Heavy, \$5.50;
Light \$5.00

Crow Bars—See Bars, Crow.**Cultivators—**

Victor Garden 50¢

Cutlery, Table—

International Silver Company:
No. 12 M'd'm Knives, 1847, 3/4 doz. \$3.50
Star, Eagle, Rogers & Hamilton
and Anchor 3/4 doz. \$3.00
Wm. Rogers & Son 3/4 doz. \$2.50

Cutters— Glass—

H. H. Mayhew Co. 60¢
Red Devil 60¢
B. Mfg. Co. 60¢
Woodward 60¢

Meat and Food—

American 30¢
No. 1 40¢
Each \$5 \$7 \$10 \$12 \$25 \$50 \$80
Enterprise:
Nos. 5 10 12 22 32
Each \$2 \$3 \$2.75 \$4.50 \$6.25 @ 7 1/4%
No. 22, \$1.50 40¢ @ 7 1/4%
P. S. & W. Co.:
Dixon's 3/4 doz. 33 1/2%
1 Nos. 1
\$11.00 \$17.00 \$19.00 \$30.00
Ideal 40¢ @ 40¢ @ 5¢
Hales 60¢ @ 10¢ @ 5¢
Little Giant 3/4 doz. 40¢ @ 50¢
Nos. 305 310 312 320 322
\$35.00 \$48.00 \$44.00 \$72.00 \$68.00
New Triumph No. 605, 3/4 doz. \$24.00
40¢ @ 10¢
Russwin Food, No. 1, \$24.00; No. 2,
\$27.00 45¢ @ 10¢ @ 10¢
Enterprise Beef Shavers 25¢ @ 30¢

Slaw and Kraut—

Henry Diston & Sons:
Slaw and Kraut Cutters 35¢
Corn Graters 30¢
J. M. Mast Mfg. Co.:
Slaw Cutters, 1 Knife 3/4 doz. \$3.00
Combined Slaw Cutter and Corn
Grater 3/4 doz. \$4.00

Tobacco—

All Iron, Cheap, .dos. \$4.25 @ \$4.50
Enterprise 25¢ @ 30¢
National, 3/4 doz., No. 1, \$11; No. 2,
\$18 40¢

Diggers, Post Hole, &c.—

Diston's:
Rapid, 3/4 doz., \$24.00 25¢
Samson, 3/4 doz., \$34.00 25¢
Iwan's Improved Post Hole Auger, 40%
Vaughan Pattern Post Hole Augers,
3/4 doz., \$7.00
Perfection Post Hole Diggers, 3/4
dos. \$8.75
Split Handle Post Hole Diggers,
Hercules Pattern, 3/4 doz. \$10.00
Kohler's, 3/4 doz., Universal, \$15.00;
Little Giant, \$12.00; Hercules,
\$10.00; Invincible, \$9.00; Rival,
\$8.50; Pioneer \$7.50
Never-Break Post Hole Diggers, 3/4
dos. 60¢

Dividers—See Compasses.**Drawing Knives—**

See Knives, Drawing.

Dressers, Emery Wheel—

Sterling Emery Wheel Dressers 35¢
Sterling Wheel Dresser Cutters 35¢

Drills and Drill Stocks—

Blacksmiths' Common Drilling
Machines \$1.50 @ \$1.75
Breast, Millers Falls 15¢ @ 10¢
Breast, P. S. & W. 35¢
Goodell Automatic Drills, 50¢ @ 10¢ @ 10¢
Millers Falls Automatic Drills, 35¢ @ 10¢
Ratchet, Curtis & Curtis 25¢
Ratchet, Parker's 40¢
Ratchet, Weston's, Style H im-
proved 40¢
Ratchet, No. 912 40¢
Ratchet, Celebrated 40¢
Ratchet, Whitney's, P. S. & W.,
Adjustable, No. 19, \$12.00 35¢ @ 5¢
Whitney's Hand Drill, No. 1, \$10.00
Adjustable, No. 19, \$12.00 35¢ @ 5¢

Twist Drills—

Bit Stock 60¢ @ 10¢ @ 10¢
Taper and Straight Shank 60¢ @ 10¢ @ 10¢

Drivers, Screw—

Screw D'river Bits, per doz. 45¢ @ 50¢
Balsey's Screw Holder and Driver,
3/4 doz., 2 1/2-in., \$6; 4-in., \$7.50; 6-in.,
\$9
Buck Bros. Screw Driver Bits 30¢
Champion 50¢
Diston's 70¢
Fray's Hol. H'die Sets, No. 3, \$12.50
Ford's Brace Screw Drivers 40¢ @ 10¢
Gay's Double Action Ratchet 35¢
Goodell's Auto 60¢ @ 10¢
Mayhew's Black Handle 40¢
Mayhew's Monarch 40¢
Millers Falls, Nos. 20 and 21 25¢ @ 10¢
Millers Falls, Nos. 11, 12, 41, 42, 15¢ @ 10¢
Smith & Hemenway Co. Never-
turn, 60%; Elmora, 60%; Star,
30¢ @ 10¢
Swan's:
Nos. 1565 to 1568, 50%; No. 1540,
40¢ @ 10¢

Eave Trough, Galvanized—

Territory. L. C. L. Galvanized
Galv. Charcoal Copper.
Steel. Iron. 14, 16 & 20 oz.
Eastern:
70¢ @ 30% 30¢ @ 10%
Central:
80% 70¢ @ 5% 30¢ @ 10%
Western and Southern:
70¢ @ 30% 30¢ @ 7 1/2%
So. Western:
75¢ @ 7 1/2% 65¢ @ 5% 30¢ @ 5%
Terms.—2% for cash. Factory ship-
ments generally delivered.
See also Conductor Pipe and Elbows.

Elbows and Shoes—

Factory shipments, all territories:
Galv. Steel and Galv. U. I.
Standard Gauge 60¢
No. 88 50¢
No. 24 85¢
No. 22 10¢
Copper 50¢ @ 10%

Elbows, Stove Pipe—

Edwards, Standard Blue 40¢ @ 10¢ @ 10¢
Edwards, Royal Blue 40¢ @ 10¢ @ 10¢
Reeves, Dover, one piece 40¢ @ 10¢

Emery, Turkish—

	4 to	5 1/2 to
Kegs lb. 5¢	5 1/4¢	5 1/4¢
14 Kegs lb. 5 1/4¢	5 1/4¢	5 1/4¢
10-lb. cans,		
10 in. cans, less	7¢	8¢
than 10 in. cans, less	10¢	8¢
Less quantity, 10¢	10¢	8¢

NOTE.—In lots 1 to 3 tons a discount
of 10% is given.

Extractors, Lemon Juice

—See Squeezers, Lemon.

Fasteners, Blind—

Zimmerman's	60¢10%
Walling's	40¢10%
Upson's Patent	40%

Cord and Weight—

Ives and Titan	33%
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Faucets—

Cork Lined	50¢10¢60%
Metallic Key, Leather Lined	60¢10¢70%

Red Cedar	40¢45¢10¢45%
Petroleum	70¢10¢75%

B. & L. B. Co.	
Metal Key	60¢10%

Star	60%
West Lock	60%

John Sommer's Peerless Tin Key	60%
John Sommer's Boss Pin Key	60%

John Sommer's Victor Mtl. Key	50¢10%
John Sommer's Duplex Metal Key	60%

John Sommer's Diamond Lock	40%
John Sommer's I. X. L. Cork Lined	50%

John Sommer's Reliable Cork Lined	50¢10%
Pike Mfg. Co.	

John Sommer's O. K. Cork Lined	60%
John Sommer's No Brand, Cedar	60%

John Sommer's Perfection, Cedar	40%
Self Measuring	

Enterprise, 3/4 doz.	\$38.00
Lane's, 3/4 doz.	\$36.00

National Measuring, 3/4 doz.	\$38.40
Self Measuring	

Felloe Plates—

See Plates, Felloe.

Files— Domestic—

List Nov. 1, 1899	
Best Brands	70¢10¢75¢10%

Standard Brands	75¢10¢80%
Lower Grade	75¢10¢100¢80¢10%

Imported—

Stubs' Tapers, Stubs' Hat, July 24, '97	\$3 1-3¢40%
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Fixtures, Fire Door—

Allith Underwriters' Approved	50%
Richards Mfg. Co.	

Universal, No. 103; Special, No. 104	\$3.75
Fusible Links, No. 96	50%

Expansion Bolts, No. 107	60¢10%
Grindstone	

Net Prices:	
1/2 in.	15 17 19 \$1

Per doz.	\$3.60 3.85 4.15 4.65
P. S. & W. Co.	25%

Reading Hardware Co.	60%
Fodder Squeezers—	

See Compressors.

Forks—

NOTE.—Manufacturers are selling from the list of September 1, 1904, but many jobbers are still using list of August 1, 1899, or selling at net prices.

Iowa Dig-Ezy Potato	60¢10%
Victor, Hay	60¢15¢20%

Victor, Manure	60%
Victor, Header	60%

Champion, Hay	60%
Champion, Header	60%

Champion, Manure	60¢15¢20%
Columbia, Hay	60¢20%

Columbia, Header	60%
Columbia, Manure	70%

Columbia, Spading	70¢15%
Hawkeye Wood Digger	60¢10%

W. & C. Potato Digger	60¢20%
Acme Hay	60¢20%

Acme Manure, 4 time	60¢10¢5%
Dakota Header	60¢20%

Jackson Steel Barley	60¢20%
Kansas Header	60%

W. & C. Favorite Wood Barley	60%
Plated—See Spoons.	

Frames— Wood Saw—

White, 8'x12' Bar, per doz.	75¢80¢
Red, 8'x12' Bar, per doz.	1.00¢1.25

Red, Dbl. Brace, per doz.	\$1.40¢1.50
Freezers, Ice Cream—	

Qt.	1 2 3 4
Each	\$1.25 \$1.60 \$1.90 \$2.20 \$2.50

Fruit and Jelly Presses—

See Presses, Fruit and Jelly.

Fry Pans—See Pans, Fry.

Fuse— Per 1000 Feet.

Hemp	\$2.75
Cotton	3.20

Waterproof Spl. Taped	3.65
Waterproof Dbl. Taped	4.40

Waterproof Tpl. Taped	5.15
Gates, Molasses and Oil—	

Stebbins' Pattern	75¢80%
Gauges—	

Marking, Mortise, &c.	50¢50¢10%
Chapin-Stephens Co.	

Marking, Mortise, &c.	50¢50¢10%
Dixton's Marking, Mortise, &c.	67%

Wire, Brown & Sharpe's	33%
Wire, Morse's	25%

Wire, P. S. & W. Co.	33%
Gimlets— Single Cut—	

Numbered assortments, per gross	
Nail, Metal, No. 1	\$2.00; 2, \$2.30

Spike, Metal, No. 1	\$4.00; 2, \$4.30
Nail, Wood Handled, No. 1	\$2.30; 2, \$2.60

Spike, Wood Handled, No. 1	\$1.50; 2, \$1.80
Glass, American Window	

See Trade Report.

Glasses, Level—

Chapin-Stephens Co.	65¢65¢10%
Glue, Liquid Fish—	

Bottles or Cans, with Brush	25¢10¢50%
Elwell's	40%

Grease, Axle—

Common Grade	gro. \$6.00¢6.50
Dixon's Everlasting, 10-lb pails, ea.	55¢; in boxes, 3/4 doz., 1 lb., \$1.20

2 lb.	\$2.00
Helmet Hard Oil	25%

Griddles, Soapstone—

Pike Mfg. Co.	33%¢33%¢10%
Grinders—	

Royal Mfg. Co.	
Alumund Grinding Machines, each	

No. 01, \$1.75; 1A, \$2.50; 10	
Web Rope	\$5.00

Alumund Sickle Grinders, each	
No. 20, \$5.00; 20A, \$6.00; 20A	

Combined, \$6.50	
Alumund Disc Grinders, each	

\$2.50	30%
Grindstones—	

Pike Mfg. Co.	
Improved Family Grindstones	

1/2 in., 3/4 doz.	\$2.00
Richards Mfg. Co., Eli and Cycle	

Ball Bearing, mounted	40%
Grips, Nipple—	

Perfect Nipple Grips	40¢10¢2%
Halters and Ties—	

Ovot Ties	60¢50¢60¢10%
Covert Mfg. Co.	

Web	30¢2%
Jute Rope	35%

Sisal Rope	20%
Cotton Rope	45%

Hemp Rope	45%
Onelida Community	

Am. Coll and Halters	40¢40¢5%
Am. Cow Ties	45¢50%

Niagara Coll and Halters	45¢50¢5%
Niagara Cow Ties	45¢50¢10¢5%

Hammers—

Handled Hammers—	
Heller's Machinists	55¢10¢55¢10¢5%

Heller's Farmers	40¢50¢10¢10¢5%
Peck, Stow & Wilcox Co.	

Crucible Steel	50%
Farriers	40¢10¢5%

Riveting	50%
Machinists, revised list	65¢65%

Blacksmiths	50¢5%
Fayette R. Plumb	

A. E. Nail	40¢25¢40¢12%¢
Eng. and B. S. Hand	50¢10¢5¢60¢5%

Machinists' Hammers	60¢60¢10%
Rivet and Tinner's	40¢7%¢40¢12%¢5%

Heavy Hammers and Sledges—

Under 3 lb., per lb.	50¢. 80¢5¢—%
3 to 5 lb., per lb.	40¢. 80¢5¢—%

Over 5 lb., per lb.	30¢. 80¢10¢5¢—%
Wilkinson's Smiths'	10¢. 9%¢10%

Handles—

Agricultural Tool Handles	
Axe, Pick, &c.	60¢10¢60¢10¢5%

Hoe, Rake, &c.	40%
Fork, Shovel, Spade, &c.	

Long Handles	40%
D Handles	40%

Cross-Cut Saw Handles—

Alkins	40%
Champion	50%

Dixton's	50%
Mechanics' Tool Handles—	

Auger, assorted	gro. \$3.00¢\$3.50
Brad Axl.	per doz. \$1.65¢\$1.75

Chisel Handles, Ass'd, per gross	
Tanged Firmer, Apple, \$2.40	

\$2.65; Hickory	\$2.15¢\$2.40
Socket Firming, Apple, \$1.75	

\$1.95; Hickory	\$1.60¢\$1.75
Socket Framing, Hickory	\$1.60¢\$1.75

File, assorted	gro. \$1.50¢\$1.40
Hammer, Hatchet, &c.	

Hand Saw, Varnished, doz.	80¢85¢; Not Varnished, 65¢75¢
Plane Handles:	

Jack, doz. 50¢; Jack, Bolted	75¢
Fore, doz. 45¢; Fore, Bolted	90¢

Chapin-Stephens Co.	
Chisel	30¢30¢10%

File and Axl.	60¢60¢10%
Saw and Plane	30¢30¢10%

Screw Driver	30¢30¢10%
Millers Falls Adj. and Hatchet Auger	15¢20%

Handles	15¢20%
Nicholson Simplicity	File Handle

W. A. Zelnicker Supply Co.	
Hammer, 3/4 doz., 12 in.	\$2.00;

14 in., \$2.00; 16 in., \$2.30; 18 in., \$2.50; 20 in., \$2.70; 22 in., \$3.00; 24 in., \$3.30; 26 in., \$3.50; 30 in., \$3.80	
Sledge, 3/4 doz., oval, 30 in., \$3.80; octagon, 30 in., \$3.80; oval, 36 in., \$4.00; octagon, 36 in., \$4.00	

Axe, 3/4 doz., 28 to 34 in., \$5.00; 36 in., \$5.80	
Adze, 3/4 doz., 36 in., \$5.80; 36 in., \$7.80	

Pick, 3/4 doz., R. R., 36 in., \$8.00; coal, 34 in., \$5.80	
Hatchet, 3/4 doz., 12 to 14 in., \$2.00	

Hangers—

NOTE.—Barn Door Hangers are generally quoted per pair, without track, and Parlor Door Hangers per double set with track, &c.

Allith Mfg. Co.	
Reliable, Nos. 1 and 2; Allith, No. 3; Allith Adjustable, No. 4; Reliable Parlor Door	50%

Chicago Spring Butt Co.

Friction	25%
Oscillating	25%
Big Twin	25%

Chisholm & Moore Mfg. Co.	
Baggage Car Door	50%

Elevator	30%
Railroad	50%

Cronk & Carrier Mfg. Co.	
Loose Axle	60¢2%

Roller Bearing	70¢2%
Solid Axle, No. 10, \$12.00	60¢10%

Roller Bearing, No. 11, \$15.00	60¢10%
Roller Bearing, Ex. Hy.	No.

22 \$18.00	60¢10%
Bull Dog, \$24.00	70%

Lane Bros. Co.	
Parlor, Ball Bearing, \$1.00; Standard, \$3.15; No. 105, \$2.85; New Model, \$2.80; New Champion	\$2.25

Barn Door, Standard	60¢10%
Hinged	net \$6.00

Covered	70¢5%
Special	70¢5%

Lawrence Bros.	
Advance	55¢10%

Cleveland	70¢7%
Clipper, No. 75	60%

Crown	55¢10%
Cyclone, No. 40	net \$6.50

Tandem, No. 50	net \$7.50
New York	55¢10%

McKinney Mfg. Co.	
Roller Bearing, Nos. 1 and 2.70%	

Anti-Friction	60%
Hinged Hangers, King Charm	60%

Richards Mfg. Co.	
Hangers, Nos. 47, 48, 147, 247, 60¢5%	

Pioneer Wood Track, No. 3, \$2.25	
Roller B'g St'l Track No. 12, \$2.20	

Roller B'g, Nos. 39, 41, 43,	70&7½%
Flange Adj. Track No. 10	50&10%

D. & H. Scovill.....27 1/2%
Am. Fork & Hoe Co. (Scovill Pat-
tern).....60%

Handled—

NOTE.—Manufacturers are selling from the list of September 1, 1904, but many jobbers are still using list of August 1, 1899, or selling at net prices.

Cronk's Weeding, No. 1, \$2.00; No. 2, \$2.50
Star Double Bit.....\$3.20
Ft. Madison Cotton Hoe.....70¢ to 10¢
Ft. Madison Crescent Cultivator Hoe.....70¢ to 10¢
Ft. Madison Mattock Hoes.....70¢ to 10¢
Regular Weight.....doz. 40¢ to 5¢
Junior Size.....doz. \$1.00
Ft. Madison Sprouting Hoe.....doz. 60¢ to 10¢
Ft. Madison Dixie Tobacco Hoe.....75¢ to 10¢ to 1 1/2¢
Kretzinger's Cut Easy.....70¢ to 10¢
Warren Hoe.....75¢ to 10¢
W. & C. L. Vanhook.....\$2.40
B. B. 6 in. Cultivator Hoe.....\$3.40
B. B. 6 1/2 in. Cultivator Hoe.....\$3.50
Acme Weeding.....doz. net, \$4.35
W. & C. L. Tinning Shovel Hoe.....doz. \$5.25

Hoisting Apparatus—
See *Machines, Hoisting.***Holders—Bit—**

Angular, 7/8 doz. \$24.00.....45¢ to 10¢

Door—

Bardley's, Iron, 40%; Brass and Bronze.....50¢
Empire.....35¢
Pullman.....35¢
Richards Mfg. Co.'s No. 117, Ever-ready, 40%; Nos. 118, 119, Sure Grip.....50¢
Superior.....33 1/2%

File and Tool—

Nicholson File Holders and File Handles.....33 1/2% to 40%

Fruit Jar—

Triumph Fruit Jar Holder, 7/8 gross, \$10.80; 7/8 doz. \$1.25

Trace and Rein—

Fernald Double Trace Holder, 7/8 doz. pairs.....\$1.25
Dash Rein Holder, 7/8 doz. pairs.....\$1.25

Hones—Razor—

Pike Mfg. Co., Belgian and Swat, 50%; German.....33 1/2%

Hooks—Cast Iron—

Bird Cere, Reading.....40%
Clothes Line, Reading List.....40%
Coat and Hat, Reading.....45¢ to 20¢
Coat and Hat, Wrightsville.....60¢ to 5¢
Harness, Reading List.....40%

Wire—

Belt.....80%
Wire C. & H. Hooks.....75¢ to 10¢
Bradley Metal Clasp Wire, Coat and Hat, 70¢ to 10¢; Ceiling.....70¢ to 10¢
Columbian Hdw. Co., Gem.....70¢ to 5¢
Parker Wire Goods Co., King, 70¢ to 10¢
Wire Goods.....10¢
Acme, 60¢ to 10¢; Chief, 70¢; Crown, 75¢; Czar, 65¢; V. Brace, 75¢; Czar Harness, 50¢ to 10¢

Wrought Iron—

Box, 6 in., per doz., \$1.00; 8 in., \$1.25; 10 in., \$1.50
Cotton.....doz. \$1.05 to \$1.25
Wrought Staples, Hooks, &c.—See Wrought Goods.

Miscellaneous—

Hooks, Bench, see *Stops, Bench*.
Rush, Light, doz., \$6.20; Medium, \$6.75; Heavy, \$7.65
Grass, best, all sizes, per doz. \$3.00
Grass, common grades, all sizes, per doz.....\$1.50
Wingtree.....lb. 5¢ to 6¢
Hooks and Eyes:
Brass.....60¢ to 60¢ to 10¢
Malleable Iron.....70¢ to 10¢
Cores, Mfg. Co. Gate and Scuttle Hooks.....40%
Ft. Madison Cut-Easy Corn Hooks, 7/8 doz. \$3.25 net
Turner & Stanton Co. and
Shoulder.....80¢ to 10¢
Bench L-12—See *Bench Stops*.
Corn Hooks—See *Knives, Corn*.

Horse Nails—

See *Nails, Horse*.

Horseshoes—

See *Shoes, Horse*.

Hose, Rubber—

Garden Hose, 1/2-inch:
Competition.....ft. 5¢ to 6¢
3-ply Guaranteed, ft. 8¢ to 9¢
4-ply Guaranteed, ft. 10¢ to 11¢
Cotton Garden, 1/2-in., coupled:
Low Grade.....ft. 8¢ to 9¢
Fair Quality.....ft. 10¢ to 11¢

Irons—Sad—

From 1 to 10.....lb. 3¢ to 1 1/2¢
B. B. Sad Irons.....lb. 3¢ to 1 1/2¢
Mrs. Potts', cents per set:
Nos. 50 55 60 65
Jap'd Tops.....85 90 95 91
Tin'd Tops.....85 90 95 95
New England Pressing, lb. 3¢ to 1 1/2¢

Bar and Corner—

Richards Mfg. Co., Bar, 60¢ to 10¢; Corner.....60%

Pinking—

Pinking Irons.....dos. 60¢

Irons, Soldering

See *Openers*.

Jacks, Wagon—

Covert Mfg. Co.:
Auto Screw.....30¢ to 2¢; Steel, 45¢
Lockport.....50%

Lane's Steel.....30¢ to 5¢
Richards' Tiger Steel, No. 130.....50¢ to 10¢
Smith & Hemenway Co.'s.....35%

Ladder—

Richards Mfg. Co., Ladder Jacks.....50%

Kettles—

Brass, Spun, Plain.....80¢ to 25¢
Enameled and Cast Iron—See Ware, Hollow.

Knives—**Butcher, Kitchen, &c.—**

Foster Bros' Butcher, &c.....30%
Wilkinson Shear & Cutlery Co.....60%

Corn—

Columbian Cutlery Co., Wilcox Brand Knives and Hooks.....40%
Wilmington Acme.....doz. \$2.65;
Dent, \$2.75; Adj. Serrated, \$2.20;
Serrated, \$2.10; Yankee No. 1, \$1.50;
Yankee No. 2, \$1.15

Drawing—

Standard List.....75¢ to 5¢ to 10¢
C. E. Jennings & Co., Nos. 45, 46, 25¢ to 1 1/2¢
Jennings & Griffin, Nos. 41, 42, 60¢ to 1 1/2¢
Swan's.....60¢ to 1 1/2¢
Watrous.....16¢
L. & I. J. White.....20¢ to 5¢ to 25¢

Hay and Straw—

Serrated Edge, per doz. \$5.50 to 5.75
Iwan's Sickle Edge.....doz. \$9.50
Iwan's Serrated.....doz. \$10.00

Miscellaneous—

Farriers'.....doz. \$3.00 to \$3.85
Wostenholm's.....doz. \$3.00 to \$3.25

Knobs—

Base, 2 1/2-inch, Birch, or Maple, Rubber Tip.....gro. \$1.25 to \$1.40
Carriage, Jap., all sizes.....gro. 40¢ to 45¢

Door, Mineral.....doz. 65¢ to 70¢
Door, Por. Jap'd.....doz. 70¢ to 75¢
Door, Por. Nickel.....doz. \$2.05 to \$2.15
Bardley's Wood Door, Shutters, &c. 15%

Lacing, Leather—

See *Beltting, Leather*.

Ladders, Store, &c.—

Allith Mfg. Co., Reliable.....50%
Lane's Store.....25%
Myers' Noiseless Store Ladders.....50%
Richards Mfg. Co.:
Improved Noiseless, No. 112.....50%
Climax Shelf, No. 115.....50%
Trolley, No. 109.....50%

Ladles, Melting—

L. & G. Mfg. Co. (low list).....20%
P. S. & W.....40¢ to 10¢
Reading.....60%

Lanterns—Tubular—

Regular, No. 0.....doz. \$4.35 to \$4.50
Side Lift, No. 0.....doz. \$4.60 to \$4.75
Hinge Globe, No. 0.....doz. \$4.60 to \$4.75
Other Styles.....40¢ to 10¢ to 10%

Bull's Eye Police—

3-inch.....\$1.25 to \$1.50

Latches—Thumb—

Roggin's Latches, with screw.....doz. 35¢ to 40¢

Door—

Allith Mfg. Co., Reliable and Allegator, 50%; Reliable Cold Storage, 50%
Cronk & Carrier Mfg. Co., No. 101, 7/8 doz. \$2.00
Richards' Bull Dog, Heavy, No. 125.....50¢ to 5¢
Richards' Trump, No. 127.....\$1.50

Leaders, Cattle—

Small.....doz. 50¢; large, 60¢
Covert Mfg. Co.:
Cotton, 45%; Hemp, 45%; Jute, 35%; Sisal, 20%.

Leathers, Pump—

See *Pumps*.

Lifters, Transom—

R. & E.....10%

Lines—

Wire Clothes, Nos. 18 19 20
100 feet.....\$2.50 2.25 2.00
75 feet.....\$2.10 1.80 1.65

Barnson Cordage Works:
Solid Braided Chalk, Nos. 0 to 3, 40%
Solid Braided Masons'.....30%
Silver Lake Braided Chalk, No. 0, \$6.00; No. 1, \$6.50; No. 2, \$7.00; No. 3, \$7.50
Masons' Lines, Shade Cord, &c.:
White Cotton, No. 3 1/2, \$1.50; No. 4, \$2.00; No. 4 1/2, \$2.50; Colors, No. 4, \$1.75; No. 4 1/2, \$2.25; No. 4 3/4, \$2.75; Lines, No. 3 1/2, \$2.50; No. 4, \$3.50; No. 4 1/2, \$4.50.....20%
Tent and Awning Lines: No. 5, White Cotton, \$7.50; Drab Cotton, \$8.50
Clothes Lines, White Cotton, 50 ft., \$2.75; 60 ft., \$3.25; 70 ft., \$3.75; 75 ft., \$4.00; 80 ft., \$4.25; 90 ft., \$4.75; 100 ft., \$5.25.....30%
Turner & Stanton Co.:
Solid Braided Chalk, Masons' and Awning Lines.....40%
Clothes Lines, White Cotton.....20%
Shade Cord, Cotton or Linen.....20%

Locks—Cabinet—

Cabinet Locks.....33 1/2%

Door Locks, Latches, &c —

NOTE.—Net Prices are very often made on these goods.
Reading Hardware Co.....40%
R. & E. Mfg. Co.....10%

Padlocks—

R. & E. Mfg. Co. Wrought Steel and Brass.....75¢ to 10%

Sash, &c.—

Ives' Patent:
Bronze and Brass, 55¢ to 5¢; Crescent, 60¢; Iron, 60¢; Window Ventilating, 40¢ to 20¢; Robinson Pat. Ventilating Sash Lock, 33 1/2%.

Pullman Patent Ventilating Lock.....35%
Reading Sash Locks.....40%

Machines—Boring—

Com. Up'r't, without Augers.....\$2.00 to \$2.25

Com. Ang'l'r, without Augers.....\$2.25 to \$2.50

Swan's Improved.....40¢ to 10¢

Jennings, Nos. 1 and 4.....25¢ to 1 1/2%

Stiller's Falls.....5.75

Snell's, Upright, \$2.65; Angular, \$2.90

Corking—

Reisinger Invaluable Hand Power.....7/8 doz. \$18.00

Fence—

Williams' Fence Machines.....each, \$5.50

Hoisting—

Moore's Anti-Friction Chain Hoist.....30%

Moore's Hand Hoist, with Lock Brake.....20%

Moore's Cyclon, High Speed Chain Hoist.....25%

Ice Cutting—

Chaudler's.....12 1/2%

Washing

Hoss Washing Machine Co.: Per doz. Boss No. 1.....\$57.00

Boss Rotary.....\$57.00

Champion Rotary Banner No. 1.....\$57.00

Standard Champion No. 1.....\$50.00

Standard Perfection.....\$27.00

Cincinnati Square Western.....\$33.00

Uneda American, Round.....\$33.60

Mallets—

Hickory.....45¢ to 50¢

Lignum vitae.....45¢ to 50¢

Tinners' Hickory and Applewood.....doz. 45¢ to 50¢

Mangers, Stable—

Swett Iron Works.....50%

Mats, Door—

Elastic Steel (W. G. Co.), new list.....50%

Keystone Wire Matting Co.:
Keystone.....50%
Ideal.....50%

Mattocks—

See *Picks and Mattocks*.

Milk Cans—See Cans, Milk.**Mills, Coffee, &c.—**

Enterprise Mfg. Co.....20¢ to 25%

National list Jan. 1, 1902.....30%

Parker's Columbia and Victoria.....33 1/2%

Parker's Box and Slide.....50¢ to 10¢

Swift, Lane Bros, Co.....30%

Motors, Water—

Divine's Red Devil.....30%

Lippincott's.....30%

Mowers, Lawn—

NOTE.—Net prices are generally quoted

Cheapest.....all sizes, \$1.85 to \$2.00

Cheap.....all sizes, \$2.00 to \$2.50

Better Grade.....all sizes, \$2.50 to \$4.50

High Grade.....\$4.50 to \$5.00 5.25

Continental.....60%

Great American.....70%

Great American Ball B'g, new list.....70%

Quaker City.....70%

Pennsylvania, Jr., Ball Bearing.....60%

Pennsylvania Golf.....50¢ to 10¢ to 5¢

Pennsylvania Horse.....33 1/2% to 5¢

Pennsylvania Pony.....40¢ to 5¢

Granite State:
Style A, Low Wheel.....70%

Style B, Low Wheel.....70%

Style C, High Wheel, spcl. list, 70¢ to 10¢

Style D, High Wheel, spcl. list, 70%

Philadelphia:
Styles M., S., C., K., T.....70¢ to 10¢ to 5¢

Style A, all Steel.....60¢ to 10¢ to 5¢

Style B, High Wheel.....70¢ to 10¢ to 5¢

Drexel and Gold Coin, special list, 40¢ to 5¢

Horse.....40¢ to 5¢

Pony.....40¢ to 5¢

36-in. Horse.....30¢ to 10¢

Eagle Horse.....30¢ to 5¢

I. X. L. Horse.....50%

Nails—

Wire Nails and Brads, Miscellaneous.....87 1/2% to 87 1/2% to 10%

Out and Wire. See *Trade Report*.

Hungarian, Finishing, Upholsterers' &c. See *Tacks*.

Horse—

Nos. 6 7 8 9 10

Anchor.....23 21 20 19 18.....40¢ to 5¢

Coleman.....13 12 11 11.....net

New Haven.....23 21 20 19 18.....40¢ to 5¢

Livingston.....19 18 17 16 16.....10%

Western.....doz. 8 1/2¢

Jobbers' Special Brands.....per lb. 9¢ to 10¢

Picture—

Brass H'd.....1 1/2 2 1/4 3 in.

Por. Head.....1.10 1.10 1.10 ..gro

Nippers—

See *Pliers and Nippers*.

Nuts—

Cold Punched: Off Hat.

Square, Blank or Tapped.....1.80¢

Hexagon, Blank or Tapped.....5.10¢

Square, Bl'k, C. T. & R.....5.10¢

Hexagon, Bl'k, C. T. & R.....5.70¢

Hot Pressed:
Square, Blank.....5.50¢

Hexagon, Blank.....5.70¢

Square, Tapped.....5.20¢

Hexagon, Tapped.....5.60¢

Oakum—

Best.....lb. 6 1/2¢

U. S. Navy.....lb. 6¢

Navy.....lb. 6¢

Plumbers' Spun Oakum.....3 1/2¢

In carload lots 1/4 lb. 4¢, f.o.b.

New York.

Oil Tanks—See Tanks, Oil.**Oilers—**

Steel, Copper Plated.....75%

Chase or Paragon.....

Brass and Copper.....50¢ to 10%

Zinc.....65¢ to 10%

Malleable, Hammers' Improved, Nos. 11, 12 and 13, 20%; Old Pattern, Nos. 1, 2, 3, 50%.

American Tube &

Pinking Irons—

See Irons, Pinking.

Pins, Escutcheon—

Brass 50¢ @ 50¢ @ 10%
 Iron, list Nov. 11, '05... 60¢ @ 60¢ @ 10%

Pipe, Cast Iron Soil—

Standard, 2-6 in. 60¢ @ 70¢
 Extra Heavy, 2-6 in. 70¢ @ 75¢
 Fittings, Stand. and Hvy. 75¢ @ 80¢

Pipe, Merchant—

Consumers, Carloads.
Steel.
Blk. Galv.
Blk. Galv.
 1/2 & 3/4 in. 64 57 41
 1 in. 66 59 41
 1 1/2 in. 68 61 49
 2 to 6 in. 72 66 56
 7 to 12 in. 69 61 46

Pipe, Vitrified Sewer—

Carload lots.
 Standard Pipe and Fittings, 3
 to 24 in., f.o.b. factory: 82%
 Second-class 85%
 NOTE.—Market irregular.

Pipe, Stove—

Edwards' Nested: C. L. I. C. L.
 6 in. Standard Blue.... 7.25 7.25
 6 in. Standard Blue.... 7.75 7.75
 7 in. Standard Blue.... 7.75 8.00
 6 in. Royal Blue.... 7.00 8.50
 6 in. Royal Blue.... 8.50 9.50
 7 in. Royal Blue.... 8.50 9.50
 Wheeling Corrugating Co.'s Nested:
 5 in. Uniform Color.... 7.15 7.65
 6 in. Uniform Color.... 6.65 7.65
 7 in. Uniform Color.... 7.65 8.65

Planes and Plane Irons—**Wood Planes—**

Bench, first qual. 30¢ @ 10%
 Bench, second qual. 40¢ @ 10%
 Molding 25¢ @ 10%
 Chapin-Stephens Co.:
 Bench, First Quality 30%
 Bench, Second Quality 40%
 Molding and Miscellaneous 25%
 Toy and German 30%
 Union 60%

Iron Planes—

Chapin's Iron Planes 50¢ @ 10%
 Union 60%

Plane Irons—

Wood Bench Plane Irons, list
 Dec. 12, '06 25%
 Buck Bros. 30%
 Chapin-Stephens Co. 50%
 Union 20%
 L. & J. White 20% @ 25%

Planters, Corn, Hand—

Kohler's Eclipse 50¢ doz. \$3.00

Plates—

Felloc 10¢ @ 1/4¢

Pliers and Nippers—

Button Pliers 75¢ @ 75¢ @ 10%
 Gas Burner, per doz. 5 in., \$1.25
 @ \$1.30; 6 in., \$1.45 @ \$1.50.
 Gas Pipe, 7 8 10 12 in.
 \$2.00 \$2.25 \$2.75 \$3.50
 Acme Nippers 50¢ @ 5%
 Cronk & Carrier Mfg. Co.:
 American Button 80%
 Improved Button 75¢ @ 10%
 Cronk's 60%
 No. 60 Linemen's 50%
 Stub's Pattern 45%
 Combination and others 35%
 Heller's Farriers' Nippers, Pincers
 and Tools 40¢ @ 40¢ @ 10%
 P. S. & W. Tanners' Cutting Nip-
 pers 40%
 Wm. Schollhorn Co.:
 Bernard, 35%; Elm City, 35%;
 Paragon, 50%; Lodi, 55%
 Swedish Side, End and Diagonal Cut-
 ting Pliers 50%
 Utica Drop Forge & Tool Co.:
 Pliers and Nippers, all kinds 40%

Plumbs and Levels—

Chapin-Stephens Co.:
 Plumbs and Levels 30¢ @ 30¢ @ 10%
 Chapin's Imp. Brass Cor. 40¢ @ 10%
 Pocket Levels 30¢ @ 30¢ @ 10%
 Extension Sights 30¢ @ 30¢ @ 10%
 Machinists' Levels 40¢ @ 40¢ @ 10%
 Diaston's Plumbs and Levels 60¢ @ 10%
 Diaston's Pocket Levels 60¢ @ 10%
 Stanley's Duplex 60%
 Woods' Extension 35%

Points, Glaziers—

Bulk and 1-lb. papers 10¢ @ 10¢
 1/2-lb. papers 10¢ @ 10¢
 1/4-lb. papers 10¢ @ 10¢

Police Goods—

Manufacturers' Lists 25¢ @ 25¢ @ 5%
 Tower's 25%

Polish—Metal, Etc—

Prestoline Liquid, No. 1 (1/4 pt.), 50¢
 doz. \$3.00; No. 2 (1 qt.), 50¢ @ 40%
 Prestoline Paste 60%

George William Hoffman:

U. S. Metal Polish Paste, 3 oz.
 boxes, 50¢ doz. \$3.00; 1 lb.
 boxes, 50¢ doz. \$1.25; 1 lb.
 boxes, 50¢ doz. \$1.25.
 U. S. Liquid, 8 oz. cans, 50¢ doz.
 \$1.25.
 Barkeepers' Friend Metal Polish, 50¢
 doz. \$1.75.

Stove—

Black Eagle Benzine Paste, 5 lb. cans,
 50¢ doz. \$2.50.
 Black Eagle, Liquid, 1/4 pt. cans,
 50¢ doz. \$2.50.
 Black Jack Paste, 1/4 lb. cans, 50¢ doz. \$2.50.
 Black Kid Paste, 1/4 lb. cans, 50¢ doz. \$2.50.
 Ladd's Black Beauty Liquid, per
 100 tins 50¢ @ 50¢ @ 10%
 Joseph Dixon's, 50¢ gr. \$3.75 10%
 Dixon's Plumbago 10%
 Firestone 10%
 Gem, 50¢ gr. \$1.50 10%
 Japanese 10%
 Jet Black 10%
 Peerless Iron Enamel, 10 oz. cans,
 50¢ doz. \$1.50

Peppers, Corn—

1 qt. Square doz. \$0.88; gro. \$8.75
 1 qt. Round doz. \$1.00; gro. \$10.00
 1 1/2 qt. Square doz. \$1.10; gro. \$11.00
 2 qt. Square doz. \$1.35; gro. \$13.50

Post Hole and Tree Au-

gers and Diggers—

See also Diggers, Post Hole, &c.

Posts, Steel—

Steel Fence Posts, each, 5 ft., 42¢;
 6 ft., 44¢; 8 ft., 45¢.
 Steel Hitching Posts each \$1.30

Potato Parers—

See Parers, Potato.

Pots, Glue—

Enameled 35¢ @ 10%
 Tinned 30¢ @ 10%

Powder—

In Canisters:
 Duck, 1 lb. each 45¢
 Fine Sporting, 1 lb. each 75¢
 Rifle, 1/2 lb. each 15¢
 Rifle, 1 lb. each 25¢
 In Kegs:
 12 1/2-lb. kegs \$3.50
 25-lb. kegs \$4.50
 King's Semi-Smokeless:
 Half Keg (12 1/2 lb. bulk) \$3.50
 Quarter Keg (6 1/4 lb. bulk) \$1.90
 Case 24 (1 lb. cans bulk) \$3.50
 Half case (1 lb. cans bulk) \$4.50
 King's Smokeless: Shot Gun Rifle.
 Keg (25 lb. bulk) \$12.00 \$15.00
 Half Keg (12 1/2 lb. bulk) 6.25 7.75
 Quarter Keg (6 1/4 lb. bulk) 3.25 4.00
 Case 24 (1 lb. cans bulk) 14.00 17.00
 Half case 12 (1 lb. c. bk.) 7.25 8.75

Presses—**Fruit and Jelly—**

Enterprise Mfg. Co. 20¢ @ 25%

Seal Presses—

Morrill's No. 1, 50¢ doz. \$20.00 50%

Pruning Hooks and Shears

See Shears.

Pullers, Nail—

Cyclops 50%
 Miller's Falls, No. 3, 50¢ doz. \$12.00 35% @ 10%
 Morrill's No. 1, Nail Puller, 50¢ doz. \$20.00 50%
 Pearson No. 1, Cyclone Spike Puller,
 each \$30.00 50%
 The Scranton Co. Case Lots: 50¢
 No. 2B (large) \$5.00
 No. 3B (small) \$5.00
 Smith & Hemenway Co.:
 Diamond B. 70%
 Giant 50%
 Staple Pullers, Utica and Davi-
 son 60%

Pulleys, Single Wheel—

Inch 1 1/2 1 3/4 2 3
 Avonning or Tackle,
 doz. \$0.30 .45 .60 1.05
 Hay Fork, Sichel or Solid Eye,
 doz., 4 in., \$1.25; 5 in., \$1.55
 Hot House, doz. \$0.65 .85 1.00
 Inch 1 1/2 1 3/4 2 3
 Screw, doz. \$0.16 .19 .25 .30
 Inch 1 1/2 1 3/4 2 3
 Side, doz. \$0.25 .40 .55 .60
 Inch 1 1/2 1 3/4 2 3

Sash Pulleys—

Common Frame; Square or
 Round End, per doz. 1 1/2 and
 2 in. 17¢ @ 20¢
 Auger Mortise, no Face Plate,
 per doz. 1 1/2 and 2 in. 20¢ @ 25¢
 Acme No. 35, 1 1/2 in., 19¢; 2 in., 20¢
 American Pulley Co.:
 Wrought Steel American Plain
 Axle 50¢ @ 10%
 Wrought Steel, Eagle 19¢ @ 25¢
 Fox-All-Steel, Nos. 3 and 7, 2 in.,
 50¢ doz. 50%
 Grand Rapids All Steel Noiseless, 50%
 Niagara, No. 25, 1 1/2 in., 19¢; 2
 in., 20¢
 No. 25, 1 1/2 in., 14¢; 2 in., 18¢
 Star, No. 25, 1 1/2 in., 19¢; 2 in., 20¢
 Tackle Blocks—See Blocks.

Pumps—

Cistern 60%
 Pitcher Spout 75¢ @ 75¢ @ 10%
 Wood Pumps, Tubing, &c. 50%
 Barnes Dbl. Acting (low list) 40¢ @ 5%
 Barnes Pitcher Spout 75¢ @ 5%
 Contractors' Rubber Diaphragm No.
 2 R. & L. Block Co. \$16.00
 Daisy Spray Pump 50¢ doz. \$6.50

Flint & Walling's Fast Mail Hand,
 (low list) 50%
 Flint & Walling's Fast Mail (low
 list) 50%
 Flint & Walling's Tight Top Pitcher.
 75¢ @ 10%
 National Specialty Mfg. Co. Measur-
 ing, Nos. 2, \$4.00; 3, \$5.50 30%
 Myers' Pumps (low list) 40¢ @ 5%
 Myers' Power Pumps 40¢ @ 5%
 Myers' Spray Pumps 40¢ @ 5%

Pump Leathers—

Lower Valve Leathers—Per gro.:
 Inch 2 1/2 3 3 1/2 4
 \$3.10 3.70 4.35 4.95 5.60
 Crimped Plunger Leathers—Per
 100:
 Inch 2 1/2 3 3 1/2 4
 \$4.75 5.25 7.80 9.65

Punches—

Saddlers' or Drive, good
 doz. 50¢ @ 75¢
 Spring, single tube, good qual-
 ity \$1.75
 Revolving (4 tubes) doz. \$3.60
 Bemis & Call Co.'s Cast St'l Drive-50%
 Morrill's Nos. 1A, 1A, 1B, 1C,
 1D, \$15.00 50%
 Hercules, 1 die, each \$5.00 50%
 Niagara Hollow Punches 40%
 Niagara Solid Punches 55¢ @ 10%
 Wm. Schollhorn Co.:
 Belt and Ticket, Bernard, 35%;
 Paragon, 50%; Lodi 55%
 Timmers' Hollow P., S. & W. Co. 40%
 Timmers' Solid P., S. & W. Co. 40%
 doz., \$1.41 40%

Rail—Barn Door, &c.—

Sliding Door, Painted Iron
 2 1/2 @ 2 1/2 @ 2 1/2
 Sliding Door, Wrought Brass,
 1 1/2 in., lb. 86¢ 30%
 Allith Mfg. Co.: Reliable Hanger
 Track 50%
 Cronk's:
 Double Braced Steel Rail, 50 ft. 3 1/4¢
 O. N. T. Rail \$3.12
 Griffin:
 100 ft. 1 x 3-16 in., \$3.25;
 1 1/4 x 3-16 in., \$3.75;
 Hinged Hanger, 100 ft. 1 x 3-16
 in., \$3.50; 1 1/4 x 3-16 in., \$4.00.
 Lane's:
 Hinged Track, 100 ft. \$3.45
 O. N. T. 100 ft. 1 in., \$3.00; 1 1/4
 in., \$3.45; 1 1/2 in., \$4.00.
 Standard, 1 1/4 in. 100 ft. \$4.00
 Lawrence Bros.:
 1 x 3-16 in., 100 ft., \$7.50; 1 1/4 x
 3-16 in., \$8.75 55¢ & 7 1/2¢
 McKimney's:
 Hinged Hanger Track, 50 ft., 11¢,
 60¢ @ 5%
 1 x 3-16 Track 55¢ & 7 1/2¢
 Myers' Stayon Track 60¢ @ 5%
 Richards' Mfg. Co.:
 Common, 1 x 3-16 in., \$3.00; 1 1/4 x
 3-16, \$3.25; 1 1/2 x 3-16, \$3.50.
 Special Hinged Hanger Rail 60¢ @ 10%
 Lag Screw Rail, No. 65 50%
 Gauge Trolley Track, 50 ft., No. 31,
 9¢; No. 32, 11¢; No. 33, 24¢
 No. 50 60¢ @ 10%
 Nos. 61, \$3.00; 62, \$3.25; 63, \$3.50; 64,
 \$4.00; 45, \$3.25; 46, \$3.50; 49, No. 1,
 \$3.25; 49, No. 2, \$3.50.

Rakes—

NOTE.—Many goods are sold at net prices.

Fort Madison Red Head Lawn \$3.25
 Fort Madison Blue Head Lawn \$2.70
 Cronk's:
 Steel Garden: Champion, 75%;
 Ideal, 80%; Victor 80¢ @ 25%
 Queen City Lawn, 50 doz., 20 teeth,
 \$2.85; 24, \$3.00 net
 Anticlog Lawn, 50 doz. \$4.00
 Malleable Garden 70¢ @ 10%
 Ideal Steel Garden, 50 doz., 12 teeth,
 \$15.00; 14, \$16.00; 16, \$18.00 80%
 Kohler's:
 Lawn Queen, 20-tooth 50¢ doz. \$3.15
 Lawn Queen, 24-tooth 50¢ doz. \$3.25
 Paragon, 20-tooth 50¢ doz. \$2.70
 Paragon, 24-tooth 50¢ doz. \$2.75
 Steel Garden, 14-tooth 50¢ doz. \$2.40
 Malleable Garden, 14-tooth, 50 doz. \$2.00 @ 2.25

Rasps, Horse—

Dieston's 75%
 Heller Bros. 70¢ @ 70¢ @ 10% & 5%
 Liveright Bros. Gold Medal 70¢ @ 75%
 McCaffrey's American Standard 60¢ @ 10% & 5%
 New Nicholson 70¢ @ 10% & 5%
 See also Files.

Razors—

Liana Bo-ras-ic 60%
 Fox Razors, 50 doz., No. 42, \$20.00;
 No. 41, \$20.00; No. 43, Platina, }
 \$25.00 }
 Red Devil 65%

Reels, Fishing—

Hendry:
 M 6, Q 6, A 6, B 6, M 9 1/2, M 16,
 Q 16, A 16, B 16, 4005, Rubber,
 Populo, Nickered Populo 20%
 Aluminum German Silv. Bronze 25%
 1240 N, 124 N 20%
 3001 N, 05 N, 6 RM, G 9 25%
 4 N, 6 PN, 24 N, 25 PN 20%
 2901 P, 33 1/4%; 2904 PN, 33 1/4%; 0294 N,
 33 1/4%; 802 N, 33 1/4%
 986 PN, 2904 N, 974 PN 25%
 5009 PN, 5009 N 20%
 Competitor, 102 P, 102 PN, 202 P,
 202 PN, 102 PR, 202 PR 20%
 304 P, 304 PN, 0304 P, 0304 PN 33 1/4%

Registers—List July 1, 1903.

Japanned, Electroplated and
 Bronzed 65%
 White Porcelain Enamel 60%
 Solid Brass or Bronze Metal 25%

Revolvers—

Single Action 85¢ @ \$1.00
 Double Action, except 44 cal. \$2.00
 Double Action, 44 caliber \$2.00
 Automatic \$4.00
 Hammerless \$4.50

Riddles, Hardware Grade

16 in. per doz. \$2.50 @ \$2.75
 17 in. per doz. \$2.75 @ \$3.00
 18 in. per doz. \$3.00 @ \$3.25

Rings and Ringers—**Bull Rings—**

Steel \$0.70 0.75 0.80 doz.
 Copper \$1.20 1.40 1.80 doz.

Hog Rings and Ringers—

Hill's Rings, gro. boxes \$4.25
 Hill's Ringers, Gray Iron, doz. 60¢
 Hill's Ringers, Malleable Iron
 doz. 80¢
 Blair's Rings per gro. \$3.00
 Blair's Ringers per doz. 75¢
 Brown's Rings per gro. \$5.25
 Brown's Ringers per doz. 75¢

Rivets and Burrs—

Copper 40¢ @ 10% @ 50%
 Carriage, Coopers', Tanners', &c.:
 Black 70¢ @ 10%
 Metallic Tinned 70%

Bifurcated and Tubular—

Assorted 46 Boxes.
 Bifurcated, per doz. boxes paste-
 board boxes, 50 count, 23¢ @ 25¢;
 7 in boxes, 100 count, 29¢ @ 32¢.
 Tubular, per doz. boxes, 50 count,
 29¢ @ 32¢; 100 count, 51¢ @ 58¢.

Rollers—

Cronk's Stay, No. 50 \$1.00
 Cronk's Brinkerhoff No. 55, \$0.60;
 No. 56, \$0.75; No. 60 \$0.75
 Lane's Stay 40%
 Richards' Stay:
 Handy Adj. and Reversible No. 53 7/8¢
 O. K. Adj. and Reversible No. 58 50¢
 Lag Screw, Nos. 55 and 57 50%
 Underwriters', Nos. 59, 60 50%
 Favorite, No. 54 60%

Rope—

Mantle, 7-16 in. diam. and larger:
 Pure lb. 13¢ @ 13 1/2¢
 Sisal, 7-16 in. diam. and larger:
 Pure lb. 9 1/4¢
 Sisal, 7-16 in. diam. and larger:
 No. 2 quality lb. 7 1/2¢ @ 8¢
 Sisal, Ray, Hide and Bale
 Ropes, Medium and Coarse:
 Mixed lb. 7 1/2¢ @ 8¢
 Pure lb. 9 1/4¢
 Sisal, Tarred, Medium Lath
 Yarn, Coarse and Untarred:
 Mixed lb. 7 1/2¢ @ 8¢
 Pure lb. 8¢
 Cotton Rope:
 Best, 1/4-in. and larger 18¢ @ 20¢
 Medium, 1/4-in. and larger 16¢ @ 17¢
 Common, 1/4-in. and larger 10¢
 In coils, 1/2 advance.
 Jute Rope:
 Thread, No. 1, 1/4-in. & up, lb., 9¢
 Thread, No. 2, 1/4-in. & up, lb., 8 1/2¢

Wire Rope—

Galvanized 37 1/2¢ @ 42 1/2¢
 Plain 45¢ @ 50%

Ropes, Hammock—

Covert Mfg. Co.:
 Jute, 35%; Sisal 20%

Rules

Boxwood 60¢ @ 60¢ @ 10%
 Ivory 35¢ @ 10% @ 35¢ @ 10% & 5%
 Chapin-Stephens Co.:
 Boxwood 60%
 Flexiford 40%
 Ivory 25¢ @ 25¢ @ 10%
 Miscellaneous 50¢ @ 50¢ @ 10%
 Stephens' Combination 55%
 Stationers' 50¢ @ 50¢ @ 10%
 Kenfel & Faser Co.:
 Folding Wood 35¢ @ 10%
 Folding Steel 33 1/2¢ @ 10%
 Lufkin's Steel 30¢ @ 10%
 Lufkin's Lumber 50¢ @ 10%
 Union Nut Co.:
 Boxwood 60¢ @ 60¢ @ 10%
 Ivory 35¢ @ 10% @ 35¢ @ 10% & 5%

Sash Balances—

See Balance, Sash.

Sash Locks—See Locks, Sash.**Sash Weights—**

See Weights, Sash.

Sausage Stuffers or Fillers

See Stuffers or Fillers, Sausage.

Saw Frames—

See Frames, Saw.

Saw Sets—See Sets, Saw.**Saw Tools—See Tools, Saw.**

Saws—

Atkins:	
Circular	45%
Band	50@50.10
Butcher Saws	50
Cross Cuts	35
One-Man Cross Cut	50
Narrow Cross Cut	50
Hand, Rip and Panel	35.5
Miter Box and Compass	40
Mulay, Mill and Drag	45
Wood Saws	40.10
Chapin-Stephens Co.:	
Turning Saws and Frames	30@30.10
Diamond Saw & Stamping Works:	
Sterling Kitchen Saws	30.10@10
Diston's:	
Circular, Solid and Ins'ted Tooth	50
Band, 2 to 18 in. wide	60
Hand, 1/4 to 1 1/2	60
Crosscuts	45
Narrow Crosscuts	50
Mulay, Mill and Drag	50
Framed Woodsaws	25
Woodsaw Blades	25
Woodsaw Rods, Tinned	15
Hand Saws, Nos. 12, 9, 8, 16, 11, 10, 12, 7, 6, 5	25
Hand Saws, Nos. 7, 10, 10 1/2, 5, 1	25
0, 00, Combination	25
Compass, Key Hole, &c.	25
Butcher Saws and Blades	30
C. E. Jennings & Co.'s:	
Back Saws	16%
Butcher Saws	25.75
Compass and Key Hole	33.75
Framed Wood Saws	25.75
Hand Saws	12.75
Wood Saw Blades	33.75
Millers Falls:	
Butcher Saws	15.10
Star Saw Blades	15.10
Massachusetts Saw Works:	
Victor Kitchen Saws	40.10@50
Butcher Saws Blades	35.40
Peace & Richardson's Hand Saws	30
Simonds:	
Circular Saws	45
Crescent Ground Cross Cut Saws	30
One-Man Cross Cut	40.10
Gang Mill, Mulay and Drag Saws	45
Band Saws	25.75
Back Saws	25.75
Butcher Saws	25.75
Hand Saws	25.75
Hand Saws, Bay State Brand	45
Compass, Key Hole, &c.	25.75
Wood Saws	40.75
Wheeler, Madden & Clemens Mfg. Co.'s Cross Cut Saws	50%

Hack Saw Blades and Frames—

Atkins' Hack Saw Blades A & A	25%
Diston's:	
Concave Blades	25
Keystone Blades	25
Hack S & Frames	30
Simonds File Co.	30
C. E. Jennings & Co.'s:	
Hack Saw Frames, Nos. 175, 180	40.75
Hack Saws, Nos. 175, 180, complete	40.75
Goodell's Hack Saw Blades	40.10
Grubb's Hack Saw Blades	35.5@10
Star Hack Saws and Blades	15.10
Sterling Hack Saw Blades	30.10@50
Sterling Hack Saw Frames	30.10@10
Sterling Power Hack Saw Machines	
each, No. 1, \$25.00; No. 2, \$30.00	10
Victor Hack Saw Blades	20
Victor Hack Saw Frames	40

Scroll—

Barnes, No. 7, \$15	25%
Barnes' Scroll Saw	40
Barnes' Velocipede Power Scroll Saw	
without boring attachment, \$18	20
with boring attachment, \$20	20
Lester, complete, \$10.00	15.10
Rogers, complete, \$3.50 and \$4.00	15.10

Scales—

Family, Turnbull's	50@50.10
Counter:	
Hatch, Platform, 1/2 oz. to 4 lbs.	5.50
Two Platforms, 1/2 oz. to 8 lbs.	16.00
Union Platform, Plain	1.70@1.90
Union Platform, Stpd.	1.83@2.13
Chattillon's:	
Eureka	25
Favorite	40
Crocker's Trip Scales	60
The Standard Portables	40
The Standard R. R. and Wag-	
on	50.10

Scrapers—

Box, 1 Handle	22.00@22.25
Box, 2 Handle	22.50@22.80
Ship	22.00
Chapin-Stephens Co. Box	30.30@10
Richards Mfg. Co., Foot	60%

Screws—Bench and Hand

Bench, Iron, doz., 1 in.	22.50
2 1/2; 1 1/2, \$3.00@3.25; 1 1/4, \$3.50@3.75	
Bench, Wood	20@20.10
Hand, Wood	70.10@70.10@10
Chapin-Stephens Co., Hand	70.70@10.25

Coach, Lag and Hand Rail—	
Lag, Cone Point	75.10@10
Coach, Gimlet Point	75.10@5
Hand Rail	70.10@75

Jack Screws—

Standard List	70.10@75
Millers Falls	50.10@10
Swett Iron Works	70.75

Machine—

List Jan. 1, '98:	
Flat or Round Head, Iron	
Bronze or Bronze	50@50.10
Fillister Head, Iron, Brass or	
Bronze	40@40.10

Set and Cap—

Set (Iron)	75.10@75.75
Set (Steel), net advance over	
Iron	25%
Sq. Hd. Cap	70.10@75.75
Hex. Hd. Cap	70.10@75.75
Rd. Hd. Cap	50.75
Fillister Hd. Cap	60.75

Wood—

List July 23, 1903.

Flat Head, Iron	87.45@
Round Head, Iron	85.45@
Flat Head, Brass	80.45@
Round Head, Brass	77.45@
Flat Head, Bronze	75.45@
Round Head, Bronze	72.45@
Drive Screws	87.45@

Scroll Saws—

See Saws, Scroll.

Scythes—

Per doz.

Grass, No. 1, Plain	\$6.25@6.75
Clipper, Bronzed Webb	\$6.50@7.00
No. 3 Clipper, Pol'd Webb	\$6.75@7.25
No. 6 Clipper and Solid Steel	\$7.00@7.50
Bush, Weed and Bramble, No. 2	\$6.50@7.00
Grain, No. 1	\$8.25@8.75
Bronzed Webb, No. 1	\$8.50@9.00
Nos. 3 and 4 Clipper, Grain	\$8.75@9.25
Solid Steel, No. 6	\$9.25@9.75

Seeders, Raisin—

Enterprise 25@30%

Sets—Axl and Tool—

Fray's Adj. Tool Handles, Nos. 1, \$12;	
2, \$18; 3, \$12; 4, \$9; 5, \$7	50%
Millers Falls Adj. Tool Handles, No.	
1, \$12; No. 4, \$12; No. 5, \$18	20@10%

Garden Tool Sets—

Ft. Madison Three Plows, Hoe, Rake	
and Shovel	1 doz sets \$9.00

Sets, Nail—

Octagon	gro. \$3.50@3.75
Buck Bros.	27.75
Cannon's Diamond Point	1 doz \$12
Mayhew's	1 doz \$9.00
Snell's Corrugated, Cup Pt.	40.10
Snell's Knurled, Cup Pt.	40.10
Victor Knurled Cup Pt.	40.75

Rivet—

Regular list 75@75.10

Saw—

Atkin's:	
Adjustable	40%
Diston's Star, Monarch and Tri-	
umph	30%
Morrill's No. 1	\$15.00
Nos. 3 and 4, Cross Cut	\$20.60
No. 5, Mill	\$30.00
Nos. 10, 11, 95	\$15.60
No. 1 Old Style	\$10.00
Special	\$16.25
Giant Royal Cross Cut	1 doz \$8.00
Royal, Hand	1 doz \$4.50
Taintor Positive	1 doz \$6.75

Shaving—

Fox Shaving Sets, No. 30	
1 doz, net	\$24.00
Smith & Hemenway Co.'s	75%

Sharpeners, Knife—

Pike Mfg. Co.:	
Fast Cut Pocket Knife Hones	1 doz \$1.50
Mounted Kitchen Sand Stone	1 doz \$1.50
Natural Grit Caring Knife	1 doz \$3.00
Quick Cut Emery Caring	1 doz \$1.50
Knife Hones, 1 doz	\$1.50
Quick Edge Pocket Knife	1 doz \$2.50
Hones, 1 doz	\$2.50

Skate—

Smith & Hemenway Co., Eureka. 50%

Shaves, Spoke—

Iron	1 doz \$1.10@1.25
Wood	1 doz \$1.75@2.25
Bailey's (Stanley R. & L. Co.)	45%
Chapin-Stephens Co.	30@30.10
Goodell's	1 doz \$9.00

Shears—

Cast Iron	7 8 9 in.
Best	\$16.00 18.00 20.00 gro.
Good	\$13.00 15.00 17.00 gro.
Cheap	\$5.00 6.00 7.00 gro.

Straight Trimmers, &c.:	
Best quality Jap.	70@70.10
Best quality Nickel	60@60.10
Tailors' Shears	40@40.10
Acme Cast Shears	40@40.5
Heinrich's Tailor's Shears	10%
Wilkinson Shear & Cutlery Co.	
Sheep, 180 list	30.10@5
Grass	50.10
Horse or Mule	60.10

Tinners' Snips—

Steel Blades	20.5@20.10
Steel Laid Blades	40.10@50
Forged Handles, Steel Blades, Berlin	50%
Heinrich's Snips	40%
Jennings & Griffin Mfg. Co.'s 6 1/2	
to 10 in.	33.75@75
Niagara Snips	40%
P. S. & W. Forged Handles	25%
W. R. W.	40.10

Pruning Shears—

Cronk's Hand Shears	33%
Cronk's Wood Handle Shears	33%
Diston's Combined Pruning Hook	
and Saw, 1/2 doz, \$18.00	10, 12, 14
Diston's Pruning Hook only	25%
\$12.00	
John T. Henry Mfg. Co.:	
Pruning Shears, all grades	40%
P. S. & W. Co.	40.10
Columbian Cutlery Co.:	
Hedge, Wilcutt Brand	60.10
Lawn and Border, Wilcutt Brand	60.10

Sheaves—Sliding Door—

Reading	40%
R. & E. list	15%

Sliding Shutter—

Reading list	40%
R. & E. list	10%

Shells—Shells, Empty—

Brass Shells, Empty:	
Climax, 10 and 12 gauge	65.10
Club, Rival, 65.5%	First Quality
60.5%	

Paper Shells, Empty:	
New Rapid, 10, 12, 16 and 20 gauge	25.10
Climax, 10 and 12 gauge; Acme, 10,	
12, 16 and 20 gauge; Ideal, 10, 12,	
16 and 20 gauge; Leader grade	25.5%
Union, League, 12 and 12 gauge	
Rival Grade	25%
New Climax, Defiance, 10, 12, 14,	
16 and 20 gauge; Climax, 14, 16	
and 20 gauge	20.5%
Challenge, Monarch, 10, 12, 16 and	
20 gauge; League, Union, 14, 16	
and 20 gauge; Repeater Grade	20%
Expert, 10, 12, 16 and 20 gauge	33.5%

Shells, Loaded—

Loaded with Black Powder	40%
Loaded with Smokeless Powder,	
medium grade	40.5%
Loaded with Smokeless Powder,	
high grade	40.10@10
Union Metallic Cartridge Co.:	
New Club, Black Powders	40%
Nitro Club, Smokeless Powders	40.5%
Arrow, Smokeless Powders	40.10@10
Winchester:	
Smokeless Repeater Grade	40.5%
Smokeless Leader Grade	40.10@10
Black Powder	40%

Shingles, Metal—Per Sq.

Edwards Mfg. Co.:	
Painted	Galv.
14 x 20	\$4.25 \$6.00
10 x 14	4.50 6.25
7 x 10	4.75 6.50
Wheeling Corrugating Co.:	
Dixie, 14 x 20 in.	\$4.25
Dixie, 10 x 14 in.	4.50
Dixie, 7 x 10 in.	5.00

Shoes, Horse, Mule, &c.—

F.o.b. Pittsburgh:	
Iron	per keg \$4.10
Steel	per keg \$3.85
Burden's, all sizes	1 keg \$3.90

Shot—

Drop, up to 1	25-lb. bag, \$1.95
Drop, B and L	2.20
Buck	2.20
Chilled	2.20
Dust	2.40

Shovels and Spades—

Association List, Nov. 15, 1902	40%
Avery Stamping Co.	40%

Snow Shovels—

Long Handle	\$3.25@3.50
Wood and Mail, D. Handle	\$3.75@4.00

Sieves and Sifters—

Hunter's Imitation	gro. \$9.50@10.00
Hunter's Genuine	per gro. \$12.00@12.50
Sieves, Seamless Metallic	
Mesh	14 16 18 20
Iron Wire	\$1.05 1.05 1.10 1.20
Tinned Wire	\$1.15 1.15 1.20 1.50

Sieves, Wooden Rim—

Nested, 10, 11 and 12 Inch	
Mesh 18, Nested	1 doz \$0.90@0.95
Mesh 20, Nested	1 doz \$1.00@1.05
Mesh 24, Nested	1 doz \$1.50@1.40

Sinks, Cast Iron—

Painted, Standard list:	
12 x 12 to 22 x 36 in.	60%
20 x 40 to 24 x 50 in.	50%
24 x 60 to 24 x 120 in.	30%
Barnes' low list:	
Up to and including 20 x 36 in.	50%
20 x 40 to 24 x 50 in.	45%
NOTE—There is not entire uniformity	
in lists used by jobbers.	

Skeins, Wagon—

Cast Iron	70@75.10
Steel	40@45

Slates, School—

Factory Shipments.	
"D" Slates	50@50.10
Eureka, Unexcelled Noiseless	60.5 tens
Victor A. Noiseless	60.4 tens 65%

Slaw Cutters—See Cutters.**Snaps, Harness—**

German	40@40.10
Covert Mfg. Co.:	
Derby, 25%; Yankee, 30.2%; Yankee	
Roller, 30.2%	
High Grade, 40%; Trojan	40%
Jockey	25%

Snaths—

Scythe 55%

Snips, Tinners—See Shears.**Spoons and Forks—****Silver Plated—**

Good Quality	50.10@60.5%
Cheap	60@60.10
International Silver Co.:	
1847 Rogers Bros., 40.10%; Rogers	
& Hamilton	40.10%
Rogers & Bro., William Rogers	
Eagle Brand	50.10%
Anchor, Rogers Brand	60%
Wm. Rogers & Son	60.10%

Miscellaneous

German Silver 60@60.5%

Tinned Iron—

Teas per gro. \$0.50@55¢

Tables per gro. \$0.50@1.00

Springs—Door—

Bardley's Spring and Check	40%
Chicago (Coll.)	40.10
Gem (Coll.)	30
Pullman (Coll.)	35
Reliance (Coll.)	40.10
Star (Coll.)	30
Torrey's Rod, 30 in.	1 doz \$1.10

Carriage, Wagon, &c.—

1 1/2 in. and Wider	Per 100 lb.
Black	\$4.75@5.00
Half Bright	\$4.75@5

Scythe Stones—		
Pike Mfg. Co., 1901 list:		
Black Diamond S. S.	gro.	\$12.00
Lamaille S. S.	gro.	\$11.00
White Mountain S. S.	gro.	\$9.00
Green Mountain S. S.	gro.	\$8.00
Extra Indian Pond S. S.	gro.	\$7.00
No. 1 Indian Pond S. S.	gro.	\$6.00
No. 2 Indian Pond S. S.	gro.	\$4.50
Leader Red End S. S.	gro.	\$4.50
Quick Cut Emery	gro.	\$10.00
Pure Corundum	gro.	\$18.00
Crescent	gro.	\$7.00
Emery Scythe Rifles, 2 Coat. . .	doz.	\$8.00
Emery Scythe Rifles, 3 Coat. . .	doz.	\$10.00
Emery Scythe Rifles, 4 Coat. . .	doz.	\$12.00
Balance of 1904 list 33 1/2%		
Electro (Artificial),	gro.	\$12.00
Lightning (Artificial),	gro.	\$18.00

Stoppers, Bottle—		
Victor Bottle Stoppers	gro.	\$9.00

Steps— Bench—		
Millers Falls	15	10%
Morrill's, No. 1, doz.	10	00
Morrill's, No. 2, doz.	12	50

Door—		
Chapin-Stephens Co.	50	00

Plane—		
Chapin-Stephens Co.	30	00

Straps— Box—		
Cary's Universal, case lots. . . .	20	10

Stretchers, Carpet—		
Cast Iron, Steel Points, doz. . .	60	00
Socket	10	00
Excelsior Stretcher and Tack Hammer Combined, doz.	30	00

Stuffers, Sausage—		
Enterprise Mfg. Co.	50	00
National Specialty Co., list Jan. 1, 1902	30	00
P. S. & W. Co.	40	00

Sweepers, Carpet—		
Bissell Carpet Sweeper Co. . . .	doz.	\$36.00
Superba, Crotch Mahogany . . .	doz.	\$33.00
Triumph, Fancy Veneers	doz.	\$30.00
Parlor Queen, Fig. Rosewood . .	doz.	\$29.00
Elite, Hungarian Ash	doz.	\$27.00
Am. Queen, Fig. Mahogany . . .	doz.	\$25.00
Ideal, Bird's-Eye Maple	doz.	\$25.00
Grand Rapids, Nickel	doz.	\$22.00
Japan	doz.	\$20.00
Standard, Nickel	doz.	\$20.00
Crown Jewel, Nickel	doz.	\$19.00
Crystal, Glass Top	doz.	\$18.00
Grand, 17 in. wide	doz.	\$16.00
Club, 24 in. wide	doz.	\$15.00
Hall, 28 in. wide	doz.	\$10.00

Sweepers, Carpet—		
NOTE.—Rebates: 50c per dozen on three dozen lots; \$1 per dozen on five-dozen lots; \$2 per dozen on ten-dozen lots; \$2.50 per dozen on twenty-five dozen lots.		

Tacks, Finishing Nails, &c.		
American Carpet Tacks	90	25
American Cut Tacks	90	25
Sweedes' Out Tacks	90	25
Sweedes' Upholsterers'	90	35
Gimp Tacks	90	35
Lace Tacks	90	35
Trimmers' Tacks	90	25
Looking Glass Tacks	65	00
Bill Posters' and Railroad Tacks .	90	40
Hungarian Nails	80	10
Finishing Nails	70	00
Trunk and Clout Nails	80	00

Tacks, Finishing Nails, &c.		
NOTE.—The above prices are for Straight Weights.		

Miscellaneous—		
Double Pointed Tacks	90	10
See also Nails, Wire.		

Tanks, Oil and Gasoline—		
Wilson & Friend Co.		
Gal.	\$2.75	\$3.00
30	\$3.50	\$4.00
120	\$5.00	\$6.75

Tapes, Measuring—		
American Asses' Skin	50	00
Patent Leather	25	00
Steel	35	00
Chesterman's	25	00
Keuffel & Esser Co.	40	00
Favorite, Ass Skin	40	00
Favorite, Duck and Leather . . .	25	00
Metallic and Steel, lower list, 30% .	30	00
30% Pocket, 30%	30	00
Lufkin's	40	00
Asses' Skin	40	00
Metallic	30	00
Patent Bend, Leather	25	00
Pocket	40	00
Steel	35	00
Webb & Hiltner	40	00
Chesterman's Metallic, No. 34L .	40	00
etc.	40	00
Chesterman's Steel, No. 1038L .	40	00
etc.	40	00

Teeth, Harrow—		
Steel Harrow Teeth, plain or headed, 1/4-inch and larger . .	per 100 lbs.	\$2.75 to \$3.00

Thermometers—		
Tin Case, Cabinet, Flange, Dairy, &c.	30	00

Ties, Bale—Steel Wire—		
Single Loop	80	10
Monitor, Cross Head, &c. 70	25	00

Tinnors' Shears, &c.—		
See Shears, Tinnors', &c.		

Tinware—		
Stamped, Japanned and Piced, sold very generally at net prices.		

Tire Benders, Upsetters, &c.		
See Benders and Upsetters, Tire.		

Tools—Coopers'—		
L. & I. J. White	20	00

Haying—		
Myers' Hay Tools	45	00

Miniature—		
Smith & Hemenway Co.'s, Davidson, doz., Nickel Plated, \$1.50; Gold Plated	20	00

Saw—		
Atkins' Cross Cut Saw Tools . . .	35	00
Simonds' Improved	35	00
Simonds' Crescent	35	00

Ship—		
L. & I. J. White	20	00

Transom Lifters—		
See Lifters, Transom.		

Traps—Fly—		
Balloon, Globe or Acme, doz. . .	\$1.15 to \$1.25	
Harper, Champion or Paragon, doz.	\$1.25 to \$1.40	
doz.	\$1.50 to \$1.50	

Game—		
Limitation Oneida	75	00
Victory	75	00
Victor	75	00
Oneida Community Jump	50	00

Mouse and Rat—		
Mouse, Wood, Choker, doz. holes .	12	00
Mouse, Round or Square Wire . .	doz.	\$5.00
Marty French Rat and Mouse Traps (Genuine)	doz.	\$13.25
No. 1, Rat, doz.	\$13.25	
No. 2, Rat, doz.	\$13.25	
No. 3, Rat, doz.	\$13.25	
No. 4, Rat, doz.	\$13.25	
No. 5, Rat, doz.	\$13.25	
No. 6, Rat, doz.	\$13.25	
No. 7, Rat, doz.	\$13.25	
No. 8, Rat, doz.	\$13.25	
No. 9, Rat, doz.	\$13.25	
No. 10, Rat, doz.	\$13.25	
No. 11, Rat, doz.	\$13.25	
No. 12, Rat, doz.	\$13.25	
No. 13, Rat, doz.	\$13.25	
No. 14, Rat, doz.	\$13.25	
No. 15, Rat, doz.	\$13.25	
No. 16, Rat, doz.	\$13.25	
No. 17, Rat, doz.	\$13.25	
No. 18, Rat, doz.	\$13.25	
No. 19, Rat, doz.	\$13.25	
No. 20, Rat, doz.	\$13.25	
No. 21, Rat, doz.	\$13.25	
No. 22, Rat, doz.	\$13.25	
No. 23, Rat, doz.	\$13.25	
No. 24, Rat, doz.	\$13.25	
No. 25, Rat, doz.	\$13.25	
No. 26, Rat, doz.	\$13.25	
No. 27, Rat, doz.	\$13.25	
No. 28, Rat, doz.	\$13.25	
No. 29, Rat, doz.	\$13.25	
No. 30, Rat, doz.	\$13.25	
No. 31, Rat, doz.	\$13.25	
No. 32, Rat, doz.	\$13.25	
No. 33, Rat, doz.	\$13.25	
No. 34, Rat, doz.	\$13.25	
No. 35, Rat, doz.	\$13.25	
No. 36, Rat, doz.	\$13.25	
No. 37, Rat, doz.	\$13.25	
No. 38, Rat, doz.	\$13.25	
No. 39, Rat, doz.	\$13.25	
No. 40, Rat, doz.	\$13.25	
No. 41, Rat, doz.	\$13.25	
No. 42, Rat, doz.	\$13.25	
No. 43, Rat, doz.	\$13.25	
No. 44, Rat, doz.	\$13.25	
No. 45, Rat, doz.	\$13.25	
No. 46, Rat, doz.	\$13.25	
No. 47, Rat, doz.	\$13.25	
No. 48, Rat, doz.	\$13.25	
No. 49, Rat, doz.	\$13.25	
No. 50, Rat, doz.	\$13.25	
No. 51, Rat, doz.	\$13.25	
No. 52, Rat, doz.	\$13.25	
No. 53, Rat, doz.	\$13.25	
No. 54, Rat, doz.	\$13.25	
No. 55, Rat, doz.	\$13.25	
No. 56, Rat, doz.	\$13.25	
No. 57, Rat, doz.	\$13.25	
No. 58, Rat, doz.	\$13.25	
No. 59, Rat, doz.	\$13.25	
No. 60, Rat, doz.	\$13.25	
No. 61, Rat, doz.	\$13.25	
No. 62, Rat, doz.	\$13.25	
No. 63, Rat, doz.	\$13.25	
No. 64, Rat, doz.	\$13.25	
No. 65, Rat, doz.	\$13.25	
No. 66, Rat, doz.	\$13.25	
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No. 68, Rat, doz.	\$13.25	
No. 69, Rat, doz.	\$13.25	
No. 70, Rat, doz.	\$13.25	
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No. 74, Rat, doz.	\$13.25	
No. 75, Rat, doz.	\$13.25	
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No. 81, Rat, doz.	\$13.25	
No. 82, Rat, doz.	\$13.25	
No. 83, Rat, doz.	\$13.25	
No. 84, Rat, doz.	\$13.25	
No. 85, Rat, doz.	\$13.25	
No. 86, Rat, doz.	\$13.25	
No. 87, Rat, doz.	\$13.25	
No. 88, Rat, doz.	\$13.25	
No. 89, Rat, doz.	\$13.25	
No. 90, Rat, doz.	\$13.25	
No. 91, Rat, doz.	\$13.25	
No. 92, Rat, doz.	\$13.25	
No. 93, Rat, doz.	\$13.25	
No. 94, Rat, doz.	\$13.25	
No. 95, Rat, doz.	\$13.25	
No. 96, Rat, doz.	\$13.25	
No. 97, Rat, doz.	\$13.25	
No. 98, Rat, doz.	\$13.25	
No. 99, Rat, doz.	\$13.25	
No. 100, Rat, doz.	\$13.25	

Traps—Fly—		
See Lifters, Transom.		

Traps—Fly—		
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